AIR TRANSPORTATION FOR INDIVIDUALS WITH DISABILITIES (14 CFR Part 382)

NOTICE OF PROPOSED RULEMAKING TO IMPLEMENT AIR-21 ACT AMENDMENT TO AIR ACCESS ACT OF 1986

PRELIMINARY REGULATORY EVALUATION

U. S. DEPARTMENT OF TRANSPORTATION

OCTOBER 2004

EXECUTIVE SUMMARY

Introduction

The Department of Transportation (DOT) is issuing a Notice of Proposed Rulemaking (NPRM) to extend its rule requiring nondiscrimination on the basis of disability in air travel to cover foreign air carriers, as directed by the AIR-21 amendment to the Air Carrier Access Act (ACAA) of 1986.[1] The purpose of this Preliminary Regulatory Evaluation (PRE)[2] is to assess the potential costs of the proposed regulations to affected air carriers and the potential benefits to the disability community, as required by Executive Order 12286.[3]

NPRM proposals concerning accessible aircraft, related services, and personnel training programs would apply to foreign air carriers operating scheduled and unscheduled (e.g., charter) passenger service between foreign and U.S. airports. The NPRM also proposes an amendment to the ACAA rule that would require U.S. and foreign air carriers to ensure the accessibility of their web sites. Collectively, these regulatory proposals are intended to ensure that persons with disabilities have access to air carrier transportation services equivalent to those provided the rest of the traveling public.

Need for ACAA Proposed Regulations

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[1]Amendment to Air Carrier Access Act of 1986, The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21), Public Law 106-181, April 5, 2000.

2 - The contributors to this document include Ms. Nancy Ebersole, its principal author; Battelle Batelle Memorial Institute, a consultant firm that worked with Ms. Ebersole in the preparation of the document; and Dr. David Lewis, who assisted in the preparation of Chapter 4 of the document and prepared the sensitivity analysis of Chapter 5.

[3]Source: Executive Order 12866, Regulatory Planning and Review (58 FR 51735), October 4, 1993. (posted on Office of Management and Budget website @ www.omb.gov

The AIR-21 provision requiring ACAA coverage of foreign air carriers was enacted in the context of the widespread use of foreign air carriers in travel into and out of the United States. Passenger air service provided by foreign carriers to the United States is an important element of the international passenger travel market. In 2001, approximately 50% of total international passengers enplaned and deplaned at U.S. airports were transported by foreign flag carriers on aircraft with 19 or more seats. An October 2002 review of the websites of foreign carriers that transported approximately 90% of passengers from the top 40 countries of origin to the U.S. in 2001 identified varying levels of accessible services offered for special needs customers. Moreover, few carriers state on their web sites that they provide aircraft cabin wheelchairs and accessible lavatories, and may deny service to wheelchair, scooter, and mobility aid users. Elderly persons who lack sufficient stamina to climb steps or walk to aircraft lavatories, unless they are accompanied by personal attendants – who may not consider themselves to be disabled in other contexts – may also have difficulty in using airline facilities and services. The proposed rule is intended to remove these and other air travel barriers encountered by persons with disabilities, when attempting to book service on and use foreign carrier flights to and from U.S. airports.

Since the Department issued its ACAA rules, the boom in internet service has resulted in both airlines and travel agents making extensive use of web sites for prospective customers to view flight information and book reservations. Many airline web sites are only partially accessible to blind and other visually impaired persons, and others are inaccessible. The NPRM's proposal to require web site accessibility is necessary to ensure persons with disabilities have access to the same information on fares, flight schedules, and reservations services that is available to other members of the traveling public.

Accessible Equipment and Personnel Training Proposals for Foreign Carriers

The NPRM proposals for accessible aircraft equipment and personnel training programs are expected to result in compliance costs to foreign air carriers conducting U.S. air passenger operations, as summarized below:

- Passenger boarding lifts or ramps for new 19+ seat aircraft that board from the tarmac via airstairs (required within two years of the final rule's effective date);

- Movable armrests on 50% of aisle seats in all classes of service (e.g., first, business and economy class) of new and refurbished aircraft with 30 or more seats, except for exit rows seats (required on new aircraft ordered after the final rule's effective date or delivered two or more years after that date), and existing aircraft in which newly manufactured seat rows are installed after the final rule's effective date;

- Accessible lavatories on new twin-aisle aircraft permitting use by passengers with disabilities, even if resulting in the installation of fewer passenger revenue seats, if necessary (required on new aircraft ordered after the final rule's effective date or delivered two years from that date);

- On-board wheelchairs on aircraft with 50 or more seats and accessible lavatories, as well as on aircraft with inaccessible lavatories, if requested in advance by passengers with disabilities, (required one year after the final rule's effective date);

- Cabin stowage space for one adult-size, folding, collapsible, or break-down wheelchair belonging to a passenger on aircraft with 100 or more seats (within one year of the final rule's effective date)

- Accessible aircraft information, terminal signage, toll-free telephone reservation services, accessible cabin safety instructions, copies of the DOT ACAA rule, and other literature in formats useful to passengers with different types of disabilities (within one year of the rule's date);

- Web sites providing flight information and reservation services by both foreign and U.S. carriers, including web sites contracting with or acting as agents of carriers (e.g., Orbitz, Expedia, Travelocity), are required to be accessible after the final rule's effective date (new web sites) or two years after that date (existing web sites);

* Training for all air carrier personnel in contact with the traveling public, concerning DOT's regulations, air carriers' implementation policies, and appropriate assistance to air travelers with disabilities (within one year of the rule's date for initial training and beginning two years after that date for recurrent and new hires training).

Foreign Carrier Data Collection and Baseline Estimates

Data collection to develop this PRE began in October 2002. It initially focused on identifying baseline estimates of the number of foreign air carriers potentially subject to DOT's proposed rule, and the proportion of their fleets and personnel used in transporting international passengers between foreign and U.S. airports. The events of September 11th caused delays in the reporting of fleet, passenger traffic, personnel, and financial data by foreign member airlines to the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA). These delays caused slippage in the publication dates of ICAO's 2001 *Summary Digest of Fleet and Personnel Statistics* and IATA's *2002 State of the Industry Report on Member Airlines.* Also, the late reporting of ICAO's data to DOT delayed development of the Bureau of Transportation Statistics 2002 T100(f) International Foreign Carrier Aviation Database. Therefore, the analysis of potential costs and benefits of the proposed rule is based on the best data available from foreign carriers and their international organizations during the time of the PRE's development.

Estimates of Potential Costs of Proposed Rule to Foreign Carriers

Most of the proposed rule's costs would be borne by approximately 125 foreign

flag operators that provide scheduled and non-scheduled, non-stop international passenger service between foreign and U.S. airports on aircraft with 19 or more passenger seats. The economic analysis projects the potential total, present-value, and average annual costs to foreign carriers of implementing the NPRM's accessible equipment and personnel training proposals over a 20-year study period (2002-2022). These costs include capital outlays and maintenance of accessible equipment, labor expenses associated with training air carrier personnel, and contingency costs related to the provision of accessible terminal facilities, information and communications systems, and aircraft safety instructions. Cost estimates for the Low and High Option Cases are based on varying assumptions about the types and amounts of accessible equipment acquired by carriers and revenue losses on new Airbus twin aisle aircraft to forego 2-4 seats to accommodate accessible lavatories. This analysis also includes a two-year cost estimate for U.S. carriers operating Part 121 and 139 aircraft with 19 or more seats to implement the accessible web site proposals, as well as the web sites of their contractors and agents.

Tables **ES-1** and **ES-2** present a summary of the potential 20-year total and present-value compliance costs to foreign flag carriers of implementing the Department's proposed rule. The lower costs assume purchase of the least expensive standard power lift or passenger ramp, boarding chairs, and lower revenue losses from seats foregone for accessible lavatories (based on the lower bound estimate of an FAA elasticity model). Under the low cost case in Table **ES-1**, the potential 20-year compliance costs of the regulatory proposals would total **$324.7** million; the present value of these costs would be **$166.4** million, and average (mean) annual cost would be **$16.2** million (derived by dividing total costs by 20 years). The high cost case assumes a mixed purchase of powered lifts and ramps with optional features including weather protection features for passengers and operators and higher speed capability, boarding chairs with additional comfort and safety features, and higher revenue losses from seats foregone for accessible lavatories (based on the upper bound estimate of an FAA elasticity model). Under the high cost case in Table **ES-2**, the potential 20-year compliance costs of the regulatory proposals would total **$415.6** million; the projected

present value of these costs would be **$204.7** million, and average (mean) annual cost would be **$20.8** million (derived by dividing total costs by 20 years). The Department recognizes, in providing average annual costs, that actual compliance costs may vary from year to year.

TABLES ES-1 AND ES-2 SUMMARY OF FOREIGN CARRIERS' POTENTIAL COMPLIANCE COSTS OF PROPOSED RULE (in Millions of 2002$)

LOW COST CASE	**20-YR COMP COST**	**PV COST**	**AVG COST/YR**
Aircraft Boarding Devices	$ 1.384	$1.161	$0.069
Movable Armrests 50% Aisle Seats	18.998	9.277	0.950
Accessible Cabin Lavatories	94.280	40.691	4.714
On-Board Wheelchairs	3.855	2.507	0.193
Cabin Stowage Area adult folding w/c	0.563	0.278	0.028
Accessible Airline Web Sites	0.297 (two year $)		
Personnel Training Program	189.079	102.015	9.454
TOTAL COSTS *Includes 5% Contingency Costs	**$324.736***	**166.421**	**16.178**
HIGH COST CASE			
Aircraft Boarding Devices	$ 2.609	2.245	0.130

Movable Armrests	18.998	9.277	0.950
Access. Cabin Lavatories	161.697	67.987	8.085
On-Board Wheelchairs	4.686	3.051	0.234
Accessible Airline webSites	0.297(two year $)		
Personnel Training	189.079	102.015	9.454
TOTAL COSTS * Includes 10% Contingency Costs	**$415.579***	$**204.692**	**$20.779**

Tables E-1 through H-3 in Appendix B of this PRE present more detailed cost estimates pertaining to foreign carriers' implementation of DOT's proposed regulations, and total two-year costs for U.S airlines and contractors and agents with passenger service web sites to implement the NPRM proposals for accessible web sites.

Potential Benefits of Proposed Rule

The proposed rule's main beneficiaries would be prospective international air travelers among the world's population of persons with permanent or temporary disabilities, including passengers who lack sufficient stamina to walk long distances or climb steps unassisted. These persons would have a far higher likelihood of being able to use foreign carrier air services if they are accessible. In addition, making airline web sites accessible would enable use by blind persons and those with limited vision. They would be able to take advantage of a wider range of scheduled flights, fare discounts, travel bonuses, and special bargain package deals offered exclusively on air carriers' web sites. In addition, many passengers with disability – perhaps as many as 60 percent – book air trips through travel agents. If these persons could book through web sites like other passengers, they would realize a saving from avoiding travel agent fees. Other beneficiaries of the proposed rule would include travel companions, family members or friends of disabled passengers whose current responsibilities for making

air travel arrangements and providing them with assistance in moving through airport terminals would be assumed by foreign carrier personnel.

Some of the Department's regulatory proposals (e.g., accessible airline reservation web sites; provision of wheelchairs and accessible passenger shuttles in foreign carriers' airport terminals; aircraft cabin wheelchairs and accessible lavatories) would benefit other members of the traveling public as well. Benefits from accessible airline web sites could spill over to travelers with limited vision who cannot read standard text on current sites. Their ability to enlarge the size of text on computer screens would enable them to read flight schedules, book flights, and realize cost savings from discounted fares, travel packages, and other promotions available only to on-line customers.

These benefits to passengers of this rule, like those from other disability nondiscrimination rules, are largely unquantifiable. Freedom from unplanned and unpredictable difficulties; knowledge of the ability to travel without discriminatory barriers; and other quality-of-life benefits are very real, and very significant, benefits of a rule of this kind. Statutory compliance aside, these qualitative benefits are the main reason for having a rule of this kind.

People sometimes assume, however, that these nonquantifiable benefits to passengers are the only benefits of a disability nondiscrimination rule, and that transportation providers realize only costs, not benefits, as a result. At least in the case of the ACAA, this is not necessarily the case.

The information we have gathered for this analysis suggests that foreign airlines should realize some economic benefits, in the form of revenue gains generated by international air passengers with disabilities and travel companions, once they implement the Department's proposals for accessible U.S air services. To the extent these regulatory proposals change foreign carriers' present practices of requiring ground personnel to carry passengers with mobility problems in boarding chairs onto aircraft via airstairs (as opposed to using mechanical lifts), both employees and passengers would realize direct benefits from reduced risks of injuries and medical costs. Foreign carriers also would realize benefits from reduced employee absences,

workmen compensation claims, and litigation.

The analysis of potential benefits to foreign carriers of implementing the DOT's NPRM proposals for accessible service on U.S. routes focuses on assessing the incremental revenue that would accrue to foreign airlines, generated by new business from international passengers with disabilities. The revenue projections are compared to compliance cost estimates for foreign air carriers in order to assess the net impacts of the proposed rule. The analysis (including a sensitivity analysis of foreign carrier revenue projections) concludes that, while there is considerable uncertainty about the scale of economic benefits to carriers, such revenues would probably exceed the airlines' compliance costs over a 20-year period.

Data and Methods

This portion of the analysis is designed to assess the potential revenue gains to foreign carriers from new international travelers with disabilities and travel companions, stimulated by the availability of accessible aircraft and related services on scheduled and non-scheduled non-stop flights between foreign and U.S. airports. Both total and present-value revenue gains are projected over the 20-year PRE study period. Both low-case and high-case scenarios are considered with respect to accessibility-induced growth in the volume of new international passengers with disabilities. In addition, we have conducted a sensitivity analysis to help understand the probabilities of certain estimates in light of the uncertainty of the data and projections we make from them.

The principal sources of data used in developing the analysis are materials concerning Canadian air travel accessibility rules and the increases in use of Canadian airlines by passengers with disabilities following the 1995 implementation of these rules. This information was then extrapolated to the broader world of international aviation, using DOT Bureau of Transportation Statistics and International Air Transport Association statistics about international passenger traffic.

This material is used to establish baseline estimates of foreign carriers operating in the U.S.; the number of existing disabled passengers transported by these carriers to the

U.S.; the number of projected new passengers traveling due to the implementation of DOT air access proposals on U.S. routes; average international fares; and projected long-range passenger and revenue growth. Data on regional and commuter foreign carriers that operate aircraft under 60 seats to the U.S. could not be collected and analyzed within the PRE's time frame; thus, the projections of new passenger and revenue are understated. The Department encourages these carriers to submit data in comments to the NPRM docket.

Growth in New Canadian Air Passengers with Disabilities Due to Canadian Carriers Implementing Accessibility Regulations to Remove Air Travel Barriers

An analytical model developed by DOT consultant Dr. David Lewis is used to estimate the potential growth in the number of Canadian air passengers with disabilities due to air carriers' implementation of the government's air carrier access regulations. The model measures the incidence of Canadians with disabilities in total enplanements in 1995, and the potential increase in their enplanements in 2001, due to the 6-year implementation of the air carrier accessibility regulations. The model is based on assumptions regarding the percentage of the Canadian population with disabilities, their incomes, age, income elasticity, and measures the impacts of physical air travel barriers on disabled air passengers' propensity to travel. Based on these assumptions, the model analysis suggests that over the six-year (1995 to 2001) implementation of the air access regulations, air travel in Canada by people with disabilities would have increased by between nine percent and 17 percent, due to Canadian air carriers removal of air travel barriers, as presented in Table 4-1.

Applying the model's 6-year growth increases of nine percent to 17 percent on an incremental basis to the 1995 baseline estimate of 872,300 Canadian adult passengers with disabilities and travel companions, as adjusted by assuming a population increase of 1% per year, yields low and high case increases of 83,337 to 157,414 additional Canadian air passengers with disabilities and companions in 2001, as shown in Table 4-

2. This 1% estimate is actually quite conservative. For example, the Canadian Census Bureau projects a 30% increase in the senior citizen age group (60-79) between 2001 and 2011 as the initial wave of "baby boomers" enter this age group. Since people in older age groups are more likely to acquire disabilities, the aging of this large population cohort is likely to increase the proportion of people with disabilities among travelers.

The analysis then extrapolates this estimate from Canadian data to other foreign air carriers. This extrapolation involves a good deal of uncertainty, since the situations of other nations' air carriers and passenger populations may not replicate Canadian data and trends. This uncertainty is the primary reason for conducting the sensitivity analysis in Chapter 5. Nevertheless, the Canadian data is the most complete the Department has been able to find at this time. We seek comment and additional data from carriers, international organizations, and other sources that will augment the information available to the Department for purposes of the final rule.

As described in greater detail in Chapter 4 and Tables 4-2 and 4-3, the analysis based on extrapolating from the Canadian data projects about 723,000 new international disabled passengers and companion trips due to foreign carriers' first year implementation of accessible air service. Based on IATA's 2002 estimate of an average $448 international air fare charged by its member airlines, as multiplied by the low case and high case incremental growth in new passengers with disabilities and travel companions, this would result in revenue gains of approximately $3.2 million in year 1.

Looking at long-term benefits, the 20-year projected present value revenue to foreign carriers from new international passengers with disabilities would range from $325.7 million (under the low case) to $615.3 million (under the high case). Based on the compliance cost estimates in Chapter 2, the projected present-value costs to foreign carriers to comply with DOT's proposed air access regulations range from $166.4 million (under the low cost case) to $204.7 million (under the high cost case) over the 20-year study period. Even if the revenue benefits realized by carriers were substantially less than projected they would still exceed the estimates of compliance costs.

CHAPTER 1

OVERVIEW

1.1 Introduction

The Department of Transportation (DOT) is required by the AIR-21 amendment to the Air Carrier Access Act (ACAA) of 1986 to extend its ACAA rule for U.S. carriers (14 CFR Part 382) to cover foreign air carriers.[4] To implement this amendment, DOT is issuing a Notice of Proposed Rulemaking (NPRM) that would require foreign air carriers operating passenger flights between foreign and U.S. airports to provide accessible aircraft (with 19 or more seats), terminal facilities, information, communication services, and personnel training programs. The NPRM also includes additional accessible service proposals for U.S. air carriers. These regulatory proposals are intended to ensure that persons with disabilities have access to international air transportation to and from the U.S. that is equivalent to that provided to other members of the traveling public. The purpose of this Preliminary Regulatory Evaluation (PRE) is to assess the potential costs and benefits of the regulatory proposals to the disability community and the world aviation industry, as well as to solicit public comments to the DOT NPRM docket for consideration in developing the Department's final rule, as required by the Administrative Procedure Act and Executive Order 12286.

1.2 Need for Proposed Regulations

Air passenger service provided by foreign flag carriers to the United States is an important element of the international passenger travel market. In 2001, approximately 50% of total international passengers enplaned and deplaned at U.S. airports were transported by foreign flag carriers.[5] Although U.S. airlines have been required since

[4] Amendment to Air Carrier Access Act of 1986, The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21), Public Law 106-181, April 5, 2000.

[5] 2001 Estimates of International Passenger Arrivals and Departures To and From U.S. Airports, U.S. Travel and Trade Commission, U.S. Department of Commerce, Washington, D.C. Posted at www.doc.gov.

1990 to provide accessible air travel services and trained personnel to assist domestic and international passengers with disabilities at both U.S. and foreign airport terminals they own, lease, or rent, there are no uniform requirements for foreign carriers to provide accessible services. An October 2002 limited review of web sites of 30 of the largest foreign carriers that transport roughly 80% of air passengers to the U.S. identified varying levels of accessible air services and conditions of carriage for special needs customers. Approximately 20 carriers stated that they provide aircraft cabin wheelchairs for mobility-impaired passengers, but only Air Canada clearly provides accessible lavatories. Moreover, many of these carries do not state that they provide accessible service to wheelchair, scooter, and mobility aid users, or to other persons with disabilities such as persons who lack sufficient stamina to climb steps or walk to aircraft lavatories. Some carriers appear to require persons with disabilities to be accompanied by personal attendants. DOT's proposed rule is intended to remove these and other air travel barriers encountered by persons with disabilities, when attempting to book service on foreign carrier flights to and from U.S. airports.

Since the Department published its 1990 U.S. air carrier access rules, the boom in internet service demand has resulted in airlines and travel agents making extensive use of web sites for prospective customers view flight information and book reservations. While the sites of some major U.S. carriers and such multi-carrier on-line travel services as Orbitz, Travelocity, and Expedia may be partially accessible to persons with disabilities, most foreign airline sites do not appear to be accessible. The proposed amendment to DOT's ACAA rules would require U.S. and foreign airlines and web sites and on-line travel services to to ensure that persons with disabilities have access to the same information and opportunities to book flights as those available to other members of the traveling public.

1.4 Statutory and Regulatory Background

1.4.1 DOT ACAA Regulations

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The Department's ACAA rules require U.S air carriers to provide accessible equipment such as lifts or ramps for aircraft, terminal facilities, information, and telecommunication services to passengers with disabilities, as well as to train personnel to provide these services. The rules also require seating accommodations for passengers with certain disabilities, cabin accommodation of service animals, reimbursement for lost or damaged wheelchairs, and modifications to air carrier policies and practices to ensure nondiscrimination.

1.4.2 Foreign Air Carrier Accessible Service Regulations, Policies, and Practices

Based on a review of 1998-2000 progress reports submitted to the European Conference of Ministers of Transport (ECMT) by member nations on the adoption of transportation accessibility guidelines, directives, and regulations, Canada and the U.S. were the only countries that reported adoption of final air carrier access regulations (Norway had drafted legislation).[6] In 1995, the European Civil Aviation Conference submitted recommendations for accessible aircraft equipment regulations to the ECMT for consideration. As of October 2002, the ECMT had drafted but not adopted final legislation to implement these recommendations for member airlines. These proposed regulations are very similar to those adopted in 1990 for U.S. airlines and Canadian government regulations issued between 1988 and 1995 that require Canadian air carriers to implement uniform conditions of carriage and personnel training, and to install accessible equipment on 30+ seat aircraft for passengers with disabilities.[7]

Based on the October 2002 website review mentioned above, All Nippon Airlines listed accessible aircraft equipment and other services for passengers with disabilities that appear to comply with most of DOT's NPRM regulatory proposals. British Airways and Virgin Atlantic Airways listed some of the accessible aircraft equipment and passenger services proposed in the NPRM, however, but while their Airbus aircraft

[6]Initial reports and updates submitted by member nations in connection with the ECMT Meeting of the Group on Transport for People with Mobility Handicaps, Paris, France, November 26/27, 1998.

[7]*Improving Transport for People with Monbility Handicaps: A Guide to Good Practice,* ECMT Report, published in 1999, p.58.

have fully accessible lavatories, their Boeing wide-body aircraft lavatories are only partially accessible. Most of the other carriers, including Lufthansa, Air France, KLM, SAS, BWIA, Scandinavian Airlines, Finnair, Iberia, El Al, Cathay Pacific, Singapore Airlines, EVA Air, Qantas,, and AeroMexico listed some accessibility equipment (e.g., boarding chairs for airline personnel to carry disabled passengers onto ground-loaded aircraft, airport wheelchairs, priority space in cabins or cargo areas to accommodate wheelchairs, on-board wheelchairs). However, many of these carriers deny service to persons requiring assistance to climb steps or walk to lavatories, unless accompanied by personal attendants. Web sites for Alitalia and Olympic Airways did not list services for special needs customers; other sites including those of Taca Peru, Taca International Airlines, Varig, Korean Airlines, and various Chinese carriers could not be accessed for various reasons. It should be noted that, to the extent foreign carriers already provide some services or equipment to accommodate passengers with disabilities, their incremental costs of meeting the proposed regulatory requirements will be reduced.

1.5 Federal Agency Criteria for Regulatory Evaluations of Proposed and Final Rules

Proposed and final Federal regulations must undergo several economic impact analyses. Executive Order 12286 requires Federal agencies to develop Preliminary Regulatory Evaluations to assess the potential compliance costs and benefits of each proposed rule for review by decisionmakers. This Order also requires a determination as to whether the projected costs of the final rule are likely to have an impact on the economy of $100 million or more per year, in which case it would constitute an economically significant regulatory action, requiring development of a detailed regulatory impact analysis.[8]

The Regulatory Flexibility Act of 1980 was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Federal rules. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance on Small Entities, establishes a threshold cost value of $92,640 (adjusted to 2002$) for operators of small planes of less than 60 seats, or a size threshold of 9 or less aircraft as the bounds for

[8] *Op cit,* Executive Order published October 1993.

estimating undue cost burdens of FAA regulations on small entities. Finally, OMB requires assessments of the potential impact of proposed and final Federal rules on U.S. international trade.

In accordance with these directives, DOT has evaluated the potential costs of foreign carriers' compliance with the NPRM's proposals. Based on the best data available, the Department has determined that the projected compliance costs to affected foreign flag carriers and U.S. carriers of implementing the NPRM proposals would not exceed $100 million annually. While this NPRM does not propose an economically significant regulation within themeaning of E.O. 12886, its economic impacts, particularly given the current difficult financial situation of the airline industry, warrant analysis.[9]

With regard to the Regulatory Flexibility Act requirements, DOT has determined that most foreign carriers with 60+ seat aircraft serving U.S. airports have fleet sizes exceeding FAA's small entity fleet threshold of less than 9 aircraft, except for Air Afrique (that also declared bankruptcy in 2002).[10] The Department does not have sufficient data on the fleet sizes and financials of Canadian, Mexican, and Caribbean regional and commuter carriers providing passenger service to the U.S. to determine whether they would meet the cost or size thresholds defined by FAA for small entities. The NPRM will request information from foreign carriers that believe they meet the small entity criteria, to determine whether they should be exempt from the proposed regulations. Finally, the Department does not believe its proposed rule would have significant impacts on U.S. international trade. Under the proposal, U.S and foreign carriers would meet essentially the same requirements, and the costs and benefits of the proposed rule to U.S. and foreign carriers would remain a very small portion of the international air travel economy. It is reasonable to conclude that the effects of the proposal would be international trade-neutral.

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[9]Source: *The World of Civil Aviation, 2001-2004, Forecasting Highlights,* ICAO website@ http://www.icao.int/icao/en/ath/fep/wca-high.htm

[10]Source: *World Aviation Report for 2001,* Air Transport World website. The Department is making use of the FAA small entity threshold since it is more specific to the airline industry than OST small entity criteria.

1.6 Foreign Air Carrier Industry

1.6.1 Foreign Air Carriers Subject to DOT's Proposed Rule

As of October 2002, FAA listed 505 foreign carriers that held certificates to operate aircraft providing scheduled and unscheduled air service to U.S airports.[11] DOT's Bureau of Transportation Statistics provided a report compiled from its International Aviation Database 2001 including counts on the number of aircraft, passenger traffic and capacity estimates reported by 118 foreign air carriers operating international passenger service to the U.S. with 60+ seat aircraft (governed under the FAA's Part 129 regulations for foreign aircraft).[12] This foreign carrier group has been adjusted from 118 to 108 carriers, based on the exclusion of Air Canada, Canadian Airlines (merged with Air Canada in 2002), seven Canadian charter airlines, and All Nippon Airways that already provide accessible equipment on 60+ seat aircraft and trained personnel to assist disabled passengers that appear to meet most NPRM proposals.[13] In addition to these 108 carriers, there are 20 Canadian, Caribbean, and Mexican carriers operating 19-59 seat regional and commuter aircraft to the U.S. that often load passengers from the tarmac via airstairs and might have to acquire boarding equipment at U.S airports to board mobility-impaired passengers. (DOT was unable to obtain information from industry sources on what boarding equipment these carriers currently have in place.)

1.6.2 U.S. Airlines Subject to DOT's Accessible Web-site Proposal

Based on U.S. airline industry 2001 statistics obtained from BTS's website and the Regional Airline Association, 64 U.S. major, national, and regional/commuter air carriers that operate domestic and international air passenger service with 19+ seat

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[11] Source: Total of 505 Foreign Air Carriers Under FAA's FAR 129 Regulations at website: http://av-info.faa.gov/OperatorsName.asp

[12] Source: T-100(f) 2001 International Aviation Database reported by foreign carriers operating non-stop passenger 60+ seat aircraft to U.S. airport, BTS Annual Report 2001, USDOT, April 2001.

[13] See also regulatory background discussion in Section 1.2.3. of this chapter.

aircraft would be subject to the NPRM proposal for accessible web sites.[14] In addition, there are at least three on-line air travel information and reservation services (i.e., Orbitz, Travelocity, and Expedia) that would be subject to the accessible web site proposals. Two on-line foreign air travel reservation sites, Galileo (15), developed by Lufthansa, Air France, Iberia, and Amadeus, also founded by foreign airlines, may also be subject to the proposed requirements, at least as to the display of information concerning service to and from the U.S.

1.6.3 International Air Travel Barriers Encounterd by Air Passengers with Disabilities

It is important to emphasize that data for this PRE analysis on the accessibility of foreign carriers' aircraft equipment and related services for passengers with disabilities was collected in 2001-2002, and it is possible that numerous foreign air carriers operating service to and from the U.S. have acquired additional accessibility equipment since that time. The Department encourages these carriers to submit comments to the NPRM docket in order to update estimates for consideration in the final rule. As noted above, to the extent that carriers have already acquired equipment that the NPRM would require, their incremental compliance costs will be less than projected in Chapter 2.

Based on foreign carrier data collected in October 2001, many air passengers with disabilities would encounter obstacles at every stage of their international air travel journeys including: moving through the public areas of foreign airports to terminals and gates; seeing or hearing airport and flight information, gate and other announcements provided on public address systems and flight arrival and departure information displayed on airport electronic monitors. In addition, deaf persons and those severely hard of hearing cannot access carrriers' toll-free flight reservation phone services that are unequipped with text information via TTYs. In addition, foreign carrier aircraft that board passengers via airstairs are not accessible to persons with mobility impairments. Other air passengers with disabilities accepted for carriage on foreign

[14] BTS 2001 list of U.S. Airline Domestic Air Carriers and Employees: www.bts.gov

Galileo was purchased in 2001 by Cendant Travel Services, a private U.S. company, and may no longer be affiliated with foreign international carriers serving the U.S

carriers report problems obtaining requested seating near lavatories; transferring with help from carrier personnel to connecting flights involving long distances between gates or other terminal concourses, and help with baggage and other services promised by carrier personnel but not delivered. Moreover, there are problems experienced by wheelchair users, those using auxiliary aids (e.g., crutches, walkers, braces, etc.), and travelers lacking sufficient stamina (e.g., some elderly persons) to walk or climb steps unassisted, who are frequently unable to use airline services in a nondiscriminatory manner. Code-sharing between U.S. and foreign carriers may lead to communications difficulties between code-share partners that further complicates service to passengers with disabilities.

1.6.4 2001 Industry Impacts

One year following the events of September 11, 2001, the International Air Transport Association (IATA) reported the impact of these events to be the most severe of any crisis the airline industry has faced in its history. These events occurred during an economic downturn that began as early as October 2000, leading to a decline in passenger traffic, particularly with respect to the premium passenger traffic on major long-haul routes, such as North Atlantic and Transpacific. The events of September 11 produced a "step-change" drop in passenger traffic primarily involving routes to, from, and within the U.S. Airlines attempted to match plummeting demand by taking capacity off the market. The industry ended 2001 with total losses on international scheduled traffic of US$12 billion--the worst loss in its history. While airlines made exceptional efforts to reduce costs, certain costs remained the same and others increased, such as the costs for new security measures and charges by some airports and air traffic control providers.[16]

1.6.5 2002 IATA International Traffic Statistics and Outlook

On February 10, 2003, IATA reported full year 2002 results for its member carriers, showing a slight net increase in international passenger traffic of 0.06% over

16 - Market and Financial Update, International Air Transport Association, September 11, 2002.

2001. However, passenger capacity fell by 4.3%, resulting in a 3.3% improvement in the overall 2002 passenger load factor. IATA's CEO and Director General, Giovanni Bisignani, highlighted the continuing traffic growth by the Asia Pacific region. "Asia Pacific carriers ended the 2002 year with encouraging passenger traffic growth of 5.8%, in contrast to the results for North American and European carriers."[17] Mr. Bisignani concluded, "If the political climate remains stable and military conflict is avoided, a 6.4% increase in total passenger traffic could be realized in 2003."

1.6.6 World Commercial Passenger Aircraft Forecasts (2001-2021)

Despite the two-year dramatic downturn in the global economy and the 9/11/01 terrorist attacks that caused severe problems throughout the aviation industry, the Boeing Company's future market forecasts (2001-2021) indicate these events had little impact on air carriers' orders for commercial passenger jets. However, these growth forecasts include caveats regarding the potential impact on sales of another catastrophic world event. Based on Boeing's forecasts, the world fleet of commercial passenger jets will more than double in size between 2001 and 2020, from 13,271 aircraft to 29,157, an increase of 112.3%, or 5.6% per year, on average. To accommodate this projected growth, carriers are projected to purchase around 16,000 new aircraft over the next 20 years, plus whatever number are needed to replace existing aircraft that are retired.

Boeing projects an annual growth rate of 3.4% for narrow body jets, and 0.98% for wide bodies. The fastest growing segment of the fleet is regional jets (with 40-99 seats), projected to increase by approximately 10% per year over the next 20 years by the Regional Airline Association, while 20-39 seat turboprops are expected to decline by 3.6% annually.[18] These rates are used in the cost analysis to project growth in the baseline 2002 foreign carrier aircraft fleet over the 20-year study period and to estimate

[17]News Release No.2: IATA International Traffic Statistics 2002, February 10, 2003 @ http://iata.mondosearch.com-bin/MsmGo.

[18]Source. 2001-2020 Worldwide Fleet Forecast, 20-99 Seats, Regional Airline Association 2002 Annual Report, p.59.

the proposed rule's impacts.

CHAPTER 2

ANALYSIS OF COSTS AND SERVICE IMPACTS OF PROPOSED AIR ACCESS REGULATIONS

2.1 Analytical Approach

This chapter presents the preliminary economic analysis which is designed to assess the potential costs to foreign flag carriers of implementing the Department's proposed rule for providing accessible passenger air services related to flights between foreign and U.S. airports. It also includes the potential costs to U.S. domestic and foreign air carriers to comply with DOT's proposals for accessible websites and for movable aisle seat armrests on 50-60 seat aircraft. Prominent among the assumptions and growth forecasts inherent in these 20-year cost projections is that there will be no major terrorist attacks on the U.S. on the scale of 9/11, and that the world aviation industry will realize a substantial recovery in international passenger traffic and profitability during this time period.

In the course of this rulemaking, a full range of accessibility equipment available on the U.S. market was evaluated that could meet the proposed rule's design features and specifications. Technical, service, and cost data obtained from equipment manufacturers are included in a series of tables in Appendix A. U.S. manufacturers make available a wide variety of equipment, and they offer options between relatively less and more costly models in some cases (e.g., less technically advanced, manually operated lifts vs. high-speed powered lifts and powered bridges that allow integrated boarding of disabled and able-bodied passengers). Equipment also differs with respect to compatibility with various aircraft types; ergonomic, safety, and emergency features; maintenance costs, and life cycles. Canadian manufacturers also offer accessibility equipment, such as DEW and APEX boarding bridges, Just Mobility boarding lifts and boarding chairs.[19] There also is European equipment on the market including

[19]Dr. David Lewis, Canadian Aircraft Boarding Equipment for Small Passenger Aircraft, HLB Decision Economics, Inc., Ottawa, Canada, 2003.

Norwegian aircraft boarding lifts and Sampson Aircraft Loaders manufactured in the United Kingdom.[20]

The approach used throughout this analysis consists of estimating the proposed rule's incremental costs to foreign air carriers to acquire and maintain equipment needed to meet accessibility requirements and conduct employee training programs, and revenue losses from foregoing seats to provide space for accessible lavatories. There also are costs related to carriers' provision of accessible terminal facilities, signage, safety and other literature in alternative formats for passengers with vision and hearing impairments, and TTY devices on toll-free airline telephone systems.

2.1.2 Data Collection

Principal sources of data used in developing this cost analysis include:

* The Federal Aviation Administration's (FAA) 2002 count of foreign carriers' certificated passenger aircraft, governed under 14 CFR Part 129 and operating between foreign and U.S. airports;

* A customized table of passenger aircraft traffic and capacity data compiled by DOT's Bureau of Transportation Statistics from its T100(f) International Aviation Database 2001, reported by 128 foreign air carriers operating non-stop Part 129 scheduled and unscheduled passenger aircraft (with 60 or more seats) between foreign and U.S. airports (included in Appendix A);

* The Regional Airline Association's 2002 Annual Report estimates of the number of U.S. commuter and regional airlines operating 19+ seat aircraft by types and models;

* The International Civil Aviation Organization (ICAO) *Digest of Statistics No.497,*

[20] *Improving Transport for People with Mobility Handicaps,* European Conference of Ministers of Transport, Paris, France, 1999.

Fleet – Personnel Data for Member Commercial Air Carriers, 2000;

* 2002 technical, service, and cost data from U.S. aircraft and equipment manufacturers; the designer of DOT's accessible web site; the Technology Director, U.S. Architectural and Transportation Barriers Compliance Board, who assisted in the design and implementation of web site accessibility guidelines for Federal agencies; web sites of some foreign and U.S. airlines and the Orbitz, Travelocity, Expedia, and Galileo on-line travel services.

* The International Air Transport Association's (IATA) CEO's State of the Industry Speech on member airlines' financial information and passenger traffic forecasts, 2002 press release;

* The Boeing Company's 2002-2022 market forecasts for world commercial jet sales and growth rates for different classes of wide- and narrow-body aircraft and regional jets.

This material is used to develop base year estimates and forecasts over a 20-year time horizon of the number of foreign air carriers; the numbers of their aircraft covered by the proposed rule; the number of air and ground crew employees providing passenger service between foreign and U.S. airports; number of U.S. airlines with 50-60 planes, and web sites operated by both foreign and U.S. airlines and on-line travel services that would be affected by DOT's proposed rule. Use of data for specific U.S. equipment to estimate compliance costs in no way implies that the Department gives special endorsement to any manufacturer's product. There is Canadian, European, and perhaps other accessible aircraft equipment on the market that could probably meet DOT regulatory proposals.

2.1.3 Data Gaps Impacting Cost Estimates

The events of September 11, 2001, caused delays in the reporting of data by most foreign carriers to their international aviation organizations that produce annual

statistical reports on member airlines. Consequently, development of base year 2002 estimates of the number of foreign carriers, aircraft fleet size, and number of employees involved in U.S. flight operations, critical to projections of the potential costs of DOT's proposed rule, have been extrapolated from data spanning a time period of 2000-2002. In many cases, available data are not sufficiently detailed to develop accurate estimates. These and other data limitations have affected the following aspects of the analysis:

* the number of U.S. airports serving foreign carriers that board passengers on ground-loaded aircraft (with 19 or more seats) and the amount of aircraft boarding equipment available at these hubs to accommodate disabled travelers;

* the number of foreign carriers' air and ground crew employees having contact with the traveling public used in U.S. flight operations;

* the number of foreign carriers' U.S. airport terminals and accessible ticket and baggage counters, signage, information and telecommunication systems already in place at these facilities;

* the number of web sites operated by foreign airlines and on-line travel services that need to be made accessible.

The cost analysis relies on the best data available during the Fall 2002 collection period, and involves the use of many assumptions to assess the potential impacts of the NPRM regulatory proposals. The Department seeks additional data from carriers and other concerned parties during the comment period on the NPRM.

2.2 Cost Methodology

An economic model is used to project the annual incremental costs for foreign carriers to implement the NPRM's accessibility equipment proposals and personnel training programs over a 20-year study period.[21] All costs are expressed in 2002 U.S.

[21]The selection of a 20-year study period (2002-2022) is based on estimates from aircraft and accessibility equipment manufacturers of the recommended design life of commercial

dollars (2002$). The model's projections include both low and high option cost cases, based on varying assumptions regarding types and models of accessible equipment that would be acquired. The primary costs of the proposed rule include five categories:

1. Capital costs, including initial and recurrent outlays, for acquisition of accessible equipment and replacements based on manufacturers' life cycle estimates.
2. Maintenance costs related to accessibility equipment.
3. Revenue losses from having foregone aircraft seats to create additional space for accessible lavatories.
4. Training costs, including course development, instruction time, initial and recurrent outlays to educate foreign carrier air and ground crews, replacement staff, and new hires used in connection with U.S. flight operations on DOT's final rule requirements, carrier policies and practices for implementing these requirements, sensitivity training to educate employees on how to render appropriate assistance to passengers with disabilities and to operate accessible equipment.
5. Costs for providing accessible terminal facilities, signage and other information conveyed through written literature (e.g. copies of DOT's final rule at foreign carriers' U.S. terminals), public address announcements, cabin safety instructions in accessible formats for use by passengers with vision and hearing impairments, flight crew training manuals explaining DOT's regulations, and TTY devices for foreign carriers' toll-free telephone reservation systems.

2.3 Base Year 2002 Foreign Carrier Fleet Estimates for Cost Assumptions and Analysis

passenger jets, accessible lavatory modules, and aircraft boarding devices.

FAA's Office of Flight Standards provided a 2002 fleet count of all Part 129 foreign carrier certificated passenger aircraft operating non-stop flights between foreign and U.S. airports.[22] This fleet count was adjusted to exclude aircraft under 19 seats not covered by the proposed rule's aircraft accessibility provisions, and accessible aircraft operated by Air Canada, seven Canadian charter airlines, and All Nippon Airways(ANA) that appear to be in compliance with DOT's regulatory proposals for accessible equipment.

Based on these adjustments, a base year 2002 fleet count of 2471 foreign carrier aircraft with 19 or more seats is used throughout this analysis to estimate the potential costs of the regulatory proposals. Based on the adjusted fleet counts, an assumption that carriers would replace 1/20 of their existing fleet each year, and Boeing's 2001-2021 growth rate projections for wide-body, narrow-body, regional and commuter aircraft, the model projects the number of accessible aircraft and boarding devices that would be acquired annually by foreign carriers to comply with the proposed rule.[23] The fleet counts are multiplied by the unit costs of equipment models and related expenses to estimate the low and high incremental costs of achieving full fleet accessibility over the 20-year study period. These costs are then summed to project the low and high potential 20-year total and annual compliance costs in undiscounted 2002 dollars and the 20-year present-value of total costs, based on a 7% discount rate.

The model also projects the potential employee training costs of the proposed rule by multiplying the foreign carriers' employee counts (for employees that would be subject to training requirements under the NPRM) by the number of hours of instruction time assumed to be needed and multiplying the total employee

[22]Source: Cindy Logan, AFS-260 Air Carrier Program Management Branch, FAA Office of Flight Standards Service, November 6, 2002 computer run of Part 129 foreign carrier aircraft operating to and from U.S. airports.

[23]Source: *Current Market Outlook/ Fleet Growth 2001-2021 for World Commercial Jet Sales*, The Boeing Company, December 2, 2000.

hours by average employee wage estimates. This estimate does not include certain other training-related costs, such as the costs of developing training materials, payments to trainers etc. If commenters on the NPRM have information on these and similar items, we would ask them to provide it so that we can fine-tune the training cost estimate for purposes of the regulatory evaluation accompanying the final rule.

In the course of this rulemaking, we contacted many manufacturers of aircraft and accessibility equipment and collected and evaluated data on a wide range of equipment currently on the market. The following sections review the NPRM's equipment proposals, the manufacturers' design features for the equipment, service and unit price data for various equipment options that could comply with these proposals. This section also presents the cost assumptions used to analyze each equipment option and the compliance cost estimates.

2.3 Summary of Requirements, Options, and Cost Assumptions Used to Analyze Each Type of Accessible Equipment and Personnel Training Program

2.3.1 Boarding Equipment Requirements

The NPRM would require foreign carriers operating aircraft with 19 or more seats to U.S. airports to conduct negotiations with U.S. airport operators within nine months of the rule's effective date and determine responsibilities for provision of boarding devices 24 months from the effective date. The NPRM excludes Fairchild Metro, Jetstream 31/32 and Beech 1900 C/D aircraft and others unable to accommodate boarding devices without risks of aircraft damage, or because cabin obstacles prevent passengers in boarding chairs from reaching non-exit row seats. Lifts and ramps purchased with Federal airport grant-in-aid assistance must comply with boarding device specifications in FAA Advisory Circular #150/5220-21B.[24]

[24]FAA Advisory Circular #150/5220-21B: Guide specification for Devices Used to Board Airline Passengers with Mobility Impairments, Federal Aviation Administration, U.S. DOT, Washington, DC, Revised 3/17/00. www.faa.gov

2.3.2 Data Collection for Lift, Ramp, and Boarding Chair Options

Websites were identified for five U.S. manufacturers that produce manual and powered boarding lifts and ramps. Some are designed to access narrow- and wide-body aircraft; others to access regional jets and turboprops. (See Appendix A, Attachment A-1 for a list of these manufacturers and Tables A-1 to A-3 for technical, service, and cost data). Most of these lifts and ramps meet FAA's boarding equipment specifications including: non-skid floors, wind stability, ability to be operated manually, a 20-year life cycle, and five-minute deployment time to board passengers from the tarmac to aircraft doorsill. Manufacturers' and carriers' estimates of the total deployment times to transfer passengers from terminal gates to aircraft seats via level-entry jetways, loading bridges, ramps, manual and powered lifts (see Appendix A, Attachment 2) range from 12.5 to 24 minutes.

Most lifts and ramps do not come with boarding chairs, which have to be purchased separately. The NPRM proposal for boarding chairs includes the following design features: adjustable footrests, movable armrests, adequate restraint systems, a backrest height adequate to assist in passenger transfer, handles to maneuver the chair, and a means of keeping the chair stationary when not in use. Web sites were found for the Columbia Medical Company and Kurt Manufacturing that manufacture boarding chairs that appear to meet all of the NPRM's equipment proposals. Columbia Medical makes two Aisle Master boarding wheelchairs, with 12-inch and 15-inch seat widths, to fit the aisles of most aircraft with 19 or more seats. Prime safety features of these chairs include crisscross body straps, plus thigh and ankle straps to hold a passenger in place, folding headrest, armrest and footrest to assist in safe boarding and transfers to seats. The unit price of both Columbia chairs is $828 (in2002$). Kurt Manufacturing produces the Aviation Aisle Ease wheelchair with a 13-inch chair width. Its prime safety features include a shoulder harness and seat belt, folding headrest, armrests, and footrest, and push bars behind headrest and footrest to assist safe boardings.

2.3.3 Boarding Equipment Cost Methodology and Assumptions

To assess the potential costs associated with complying with lift and boarding chair requirements in the proposed rule, both high and low-cost cases were constructed for this analysis. Based on input from boarding equipment manufacturers, the economic life of boarding lifts and ramps is estimated at 20 years, and that of boarding chairs is estimated at 10 years.[25] The discount rate used to perform cash flow analysis is 7 percent. Based on information submitted to DOT by the operators of 10 of the 20 U.S. top international gateway airports that serve over 90% of affected foreign carriers' aircraft, level-entry passenger jetways and platforms are provided for all foreign carrier aircraft. The low-cost case assumes the remaining 10 gateway airports serve some foreign carriers' ground-loaded narrow-body, wide-body, regional or commuter aircraft, and carriers would purchase the least expensive power lift based on the manufacturers' quote of $34,000 per unit, the least expensive passenger ramp at a $15,900 unit cost, and least expensive boarding chair priced at $525/unit to board passengers with disabilities. In addition, the low-cost case assumes 20 Canadian, Mexican, and Caribbean carriers operate ground-loaded regional/commuter aircraft at 30 U.S. medium and small hubs, and would also acquire the least expensive passenger ramps and boarding chairs. The low-cost case also includes manufacturers' quotes of annual maintenance costs at $20 per chair and $500 per lift and ramp, plus a one-time cost in the first year after the final rule's effective date for foreign carriers and airport operators to conduct the negotiations required by the proposed rule.

The high-cost case scenario includes the aforementioned least expensive ramps and boarding chairs for ground-loaded regional and commuter aircraft operating at the 10 U.S. gateway airports, plus the acquisition of a mix of standard to deluxe lifts at an average unit price of $81,140. The basis of this assumption is that some carriers would purchase higher priced lifts with heated cabins, weather winterization packages, and more powerful engines capable of

[25]Source: See technical, service, and cost data provided by accessible equipment manufacturers in Appendix B, Tables B-1 through B-5.

speeds of up to 30 miles per hour. The high cost case also assumes 20 Canadian, Mexican, and Caribbean operate ground-loaded regional/commuter aircraft at 30 medium and small hubs, and include the same less costly passenger boarding ramps and chairs. In addition, the high cost case includes the same annual maintenance costs for boarding chairs, an average annual maintenance cost of $800 per higher-priced lift, plus first year costs for carrier and hub operators to conduct equipment negotiations.

2.4 NPRM Requirement for Movable Aisle Seat Armrests

The proposed rule requires affected foreign carriers to install movable armrests on 50 percent of aisle seats, excluding exit rows, distributed proportionately over all classes of service, on both new and refurbished foreign carrier aircraft. Carriers would have to provide movable armrests on new aircraft ordered after the final rule's effective date and on those delivered two years after that date, plus whenever aircraft seats were replaced with newly-manufactured seats.

2.4.1 Data Collection on Movable Armrest Equipment Options

A variety of movable armrest designs, including fold back, flip up, and push down/pull up versions, can be ordered as replacements for standard fixed-bracket aisle seat armrests supplied on most seat configurations for aircraft with 40 or more seats. Commuter aircraft with less than 40 seats generally do not have ar rests. A search of web sites for seat producers found only B/E Aersopace Inc., which has plants in the U.S. and Europe. B/E Aerospace quotes a unit price of $35 per movable armrest installed on new and refurbished aircraft aisle seats.

2.4.2 Movable Aisle Seat Armrests: Cost Methodology and Assumptions

The analysis is based on the assumption that cabin furniture will be replaced in aircraft every seven years, and carriers would begin installing movable armrests on 50 percent of all aisle seats on new and refurbished non-exempt aircraft beginning in Year 2 of the PRE 20-year study time frame. No

expenditures are assumed for the first year of the analysis because the NPRM does not require that current orders pre-dating the effective date of the rule be revised to meet new regulatory requirements. Counts on the average numbers of seats in each class of service for wide- body and narrow-body jets were obtained from aircraft cabin diagrams posted on Boeing and Airbus websites. Counts for regional and commuter aircraft are based on data from the RAA. Based on manufacturer B/E Aerospace's price quote, the unit cost per movable aisle seat armrest is assumed to be $35 per seat.

2.5 Twin-Aisle Aircraft Accessible Lavatories

The NPRM would require an accessible lavatory on new twin aisle aircraft ordered after the final rule's effective date or delivered two or more years from that date. The NPRM also would require existing twin-aisle aircraft, in which lavatories are replaced, to be equipped with accessible lavatories. Carriers would be required to remove revenue seats, if necessary, to enlarge aircraft lavatories sufficiently to accommodate passengers in on-board wheelchairs.

2.5.1. Data Collection on Cabin Design Modifications, Hardware Equipment for Accessible Lavatories

Representatives from Boeing and Airbus were asked to update technical, service and cost data on various accessible lavatory designs and features provided for DOT's 1990 final ACAA rule for U.S. air carriers. Based on information obtained from cabin engineers by Mr. Webb Heath, Boeing's government relations representative in Washington, D.C., Boeing produces accessible lavatory modules for 767, 777, and 747 model aircraft that meet all NPRM design feature requirements including: wider doors for wheelchair entry, lowered doorsill, grab bar and assist handles, lowered door latch, lowered light switch, accessible faucets, call buttons, and modesty curtain. According to Boeing, the accessible lavatory design for these aircraft would not result in carriers having to forego revenue seats. The capital cost quoted by Boeing's representative to purchase the accessible lavatory module is $12,500 per lavatory (in 2002$). Based on input from Airbus's Toulouse, France marketing director,

Mr. Mason, the expanded lavatory and on-board chair requirements would result in foregoing four revenue seats on new Airbus twin-aisle wide-body jets. Mr. Mason also agreed with Boeing's capital cost estimate for accessible lavatory modules.

2.5.2 Data Collection for Estimating Revenue Seat Loss of New Airbus Aircraft

Information was not available from the foreign carrier industry to estimate the potential revenue loss from seats foregone on Airbus new twin-aisle aircraft. Information was obtained from FAA's Policy Office about an elasticity model constructed by a staff member for a year 2000 analysis that estimated the revenue loss for the last seat sold on a U.S. aircraft used in domestic operations. The economist who developed this model provided a paper explaining the methodology and assumptions used to project low and high case revenue losses from removing the last seat on an aircraft for use in the PRE cost analysis.[26]

2.5.3 Cost Assumptions for Accessible Lavatories on Twin-Aisle Aircraft

Both low and high cost cases were constructed to estimate the potential compliance costs of the accessible lavatories regulation. The costs to foreign carriers include two forms: estimates of the potential capital costs associated with expanded lavatories, and annual revenue losses due to foregoing up 2-4 seats assumed on Airbus twin-aisle aircraft due to space needed for accessible lavatories. An important distinction in computing costs of foregoing a certain number of revenue seats is that once revenue seats are foregone, the resultant costs occur year after year for those aircraft. That is, foregoing revenue seats results in monetary losses that accrue over the 20-year estimated average life of the aircraft (though only on flights where those seats would have been sold).

The capital cost assumptions for this analysis are derived from estimates of the current foreign carrier fleet that would be subject to the proposed rule, grown at roughly 0.98 percent annually over the 20-year PRE study period. This

[26] Interview with Stephen Hoffer, Economist in FAA's Office of Policy and Plans and developer of the model. April 2003.

is based on Boeing's market projections for 2001-2021 commercial jet orders.[27] Recurrent capital costs are based on the assumption that five percent of the 2002 fleet of twin-aisle aircraft will be retired and replaced annually. This assumption is consistent with the 20-year analysis timeframe and assumptions used regarding the economic life of an aircraft. As noted above, Boeing and Airbus estimate that the capital cost of accessible lavatory modules is estimated at a unit cost of $12,500 per unit. With respect to revenue seat losses, Mr. Heath indicates that Boeing's design for accessible lavatory modules installed on new 747-777 aircraft does not displace any seats. This analysis assumes that when foreign carriers operating existing Boeing, McDonnell Douglas, or Lockheed twin-aisle aircraft that do not have accessible lavatories replace them in the future, they do so with Boeing aircraft that would not involve loss of revenue seats.

Based on input from Airbus, including an accessible lavatory would result in foregoing 2- 4 revenue seats on new Airbus twin-aisle aircraft. Estimates of foreign carriers' potential resultant revenue losses from on Airbus aircraft are based on an FAA staff economist's elasticity model constructed for an analysis in 2000 that estimated the revenue loss for the last seat sold on a U.S. aircraft used in domestic operations. The model analysis is based on assumption that airlines will add seats until marginal revenue is equal to marginal cost; thus, the cost of removing the last seat would be negligible. For the high cost case, the FAA's revenue loss estimate for foregoing one seat has been adjusted upwards to account for higher fares charged for international air trips, inflation costs, and higher revenue losses associated with removal of seats 3 and 4 on Airbus aircraft.

2.6 On-Board Wheelchairs

The NPRM would require foreign carriers' twin-aisle aircraft with inaccessible lavatories to be equipped with an on-board wheelchair, within one year of the final rule's effective date. Carriers also would be required to supply on-board wheelchairs on aircraft with 50 or more seats and inaccessible lavatories, if requested by passengers with disabilities at least 48 hours in

[27] *Op cit*, www.boeing.com/marketforecasts

advance of flights. Proposed design features for on-board chairs would include: footrests, movable or removable armrests, adequate occupant restraint systems, a backrest height that permits assistance for passenger transfers, structurally sound handles to maneuver the chair, and wheel locks or other means to prevent chair movement during passenger transfers. In addition, chairs would have to be compatible with the maneuvering space, aisle width, and passenger seat height of the aircraft they would be used on, and be easy for carrier personnel to push, pull, and turn in the cabin. Carriers also would have to provide storage space or mountings for the on-board chair in each aircraft, which suggests a collapsible chair would be preferable.

2.6.1. Data Collection for On-Board Chair Equipment Options

Currently, most air carriers and airports use a variety of boarding chairs and high-back Dolly chairs to transport passengers through terminals, between terminal gates and aircraft, and down cabin aisles to their seats. On-board wheelchairs differ from boarding chairs. On-board chairs are lighter in weight and collapsible, because they have to be carried on aircraft. A web site search identified Columbia Medical and RJ Mobility as producers of on-board wheelchairs that would meet the NPRM requirements. Columbia Medical produces two versions of TravelMate chairs with a 16-inch seat width that will fit the aisles of most aircraft with 50 or more seats, and prime safety features including crisscross body straps to hold a passenger in place, folding headrest, armrests and footrests, and wheel locks. The chairs differ significantly in size and range in cost from $895 to $1,005. The lower-priced chair does not have lifting handles to deplane a passenger at a foreign airport, so foreign carriers may find the more expensive version more attractive, or will have to find another means of deplaning the passenger.

The second manufacturer, RJ Mobility, produces the Airline Locker on-board wheelchair with a 16.5 inch chair width that also can negotiate the aisles of aircraft with 50 or more seats. The RJ chair has similar features to the Columbia Medical chair, though it is somewhat more compact. However, the weight capacity limit of 300 pounds for the Columbia Medical chair should accommodate most passengers, while the 225 pound weight limit for RJ

Mobility's chair would preclude use by some passengers. Also, the RJ chair has a higher price of $1488 per unit.

2.6.2 Cost Assumptions for On-Board Wheelchair Analysis

The low and high cost case assumptions used to estimate carrier compliance costs of on-board chairs vary with regard to the number of 50+ seat twin-aisle aircraft with accessible or inaccessible lavatories to be equipped. The low cost case compliance costs are based on the assumption that foreign carriers would purchase the Columbia on-board wheelchair at a unit cost of $895 for use on existing and new twin-aisle aircraft equipped with accessible lavatories. The high cost case assumes that in addition to purchasing Columbia chairs for twin aisle aircraft, carriers would also purchase a reserve stock of on-board chairs for 25% of aircraft with over 50 seats and inaccessible lavatories, to ensure their availability if requested by passengers with disabilities.

2.7 Priority Cabin Stowage Area for a Folding Adult-Sized Passenger Wheelchair

The NPRM requires foreign carriers' new Part 129 aircraft (with 100 or more seats) delivered two or more years after the effective date of DOT's final rule to include a designated cabin priority stowage space for at least one adult-size, folding standard wheelchair.

2.7.1 Data Collection for Expanded Cabin Stowage Area For Adult Folding Wheelchair

Mr. Webb Heath of Boeing and Mr. Dale Mason of Airbus commented that most new wide-body aircraft already have a stowage area large enough to accommodate a folding wheelchair. Modification of a coat closet on a new narrow-body aircraft would not involve substantial engineering and design costs, they said. Assuming these costs are spread over 20 years for new narrow-body aircraft, the engineering costs should be insignificant. The capital cost to move a coat closet shelf and add two wheelchair tie-downs is estimated at $500 per aircraft for 759 new and replacement Part 129 narrow-body aircraft.

2.8 NPRM Proposal for Accessible Airline Web Sites

The NPRM would require U.S. airlines to make all domestic and international flight and other information on their web sites accessible to persons with vision impairments. websites meeting the section 508 standards developed for Federal agency web sites would comply with this requirement. Foreign carriers would only have to make accessible the portion of their web sites displaying information related to flights serving U.S. airports. These requirements would also apply to multi-carrier travel service web sites that groups of carriers own or with whom carriers have contractual or agency relationships. The NPRM gives carriers and other covered parties two years from the final rule's effective date to make existing web sites accessible. New web sites coming on line after the effective date would have to be accessible from the beginning.

2.8.1 Background Information and Data Collection for Accessible Web Sites

Each disability presents unique challenges to developers of web site content and computer users (28). The design of a web site determines to a large extent who is able to access that site, and the web is not easy for some people with special needs to use. Web users with a visual disability are often stymied by web pages that rely on images, low contrast colors or small font text to convey a site's content. Some blind and low vision users depend on assistive technologies (e.g. screen readers, Braille display, or screen magnifiers) for web access. However, these tools only work on sites that have been carefully built to allow access.

Approximately 64 U.S. airlines and 125 foreign carriers provide websites that offer discount fares and other benefits to travelers who book flights directly on their sites. In addition, there are three major on-line travel sites affiliated with U.S. airlines that provide consumers information and reservation booking

28 - Disabilities other than those involving vision can pose challenges to users and designers of web sites. For example, deaf or hard-of-hearing users cannot hear the sound track of multimedia. Users with limited physical dexterity might not be able to drop and drag or do other activities requiring a mouse. However, the proposed requirements of the NPRM, like the section 508 standards themselves, focus on accessibility to persons with vision impairments.

services. Travelocity, owned by Sabre Holding Corporation, pioneered on-line travel service on the web, and provides flight reservations and fare information for over 700 airlines. The Orbitz travel site developed by five major U.S. airlines also sells airline tickets at negotiated rates well below the suppliers' published rates. A third U.S. on-line travel service website, Expedia, is owned by Microsoft.

In addition, Lufthansa, Air France, and Iberia airlines created Amadeus and Galileo computer reservation websites to compete for travel agency customers booking overseas flights. Galileo was purchased in 2000 by Cendant Travel Services, a private U.S. company, and presumably would be subject to the NPRM proposal.

Information on Web Accessibility Standards and Guidelines

The U.S. General Services Administration's Center for Information Technology Accommodation is responsible for building the infrastructure to support section 508 standards implementation, and educating government and private sector employees to use accessible products to create accessible sites (see guidelines on GSA technical assistance and training courses at http://www.gcn.com). The U.S. Architectural and Transportation Barriers Compliance Board (Access Board) developed the 508 standards based on the World Wide Web Consortium's (W3C) web accessibility standards that can be viewed at www.W3C.org. Accessible versions of some electronic and information technology products, particularly computers and accessibility software and guidelines, are available to satisfy these standards. For web site developers, the most important standards are contained in the Consortium's Web Content Accessibility Guidelines (WCAG) that provide a blueprint of checkpoints, and associated techniques that describe how to ensure the accessibility of a site.

2.8.2 Design and Cost Assumptions for Building an Accessible Airline Web Site

Mr. Douglas Wakefield, the Access Board's Technical Director who provides technical assistance and advice to private companies on implementing the Board's section 508 standards, provided information to the Department on the feasibility and costs of making an airline reservation website accessible to

persons with disabilities. Most airline sites have dynamic home pages that require users to type in information on airport origins and destinations in order for the search engine to create additional web pages displaying selected airline flights and fares that satisfy the user's travel criteria.[29] Mr. Wakefield routinely books flights on United, Delta, and Expedia web sites, using a Macromedia Dreamweaver software product that provides a checklist of the steps and prompts for accessibility attributes to enable him to read text information with a screen reader. He estimates that very little labor and time would be required for a web master or skilled programmer to make a dynamic airline site easily accessible to persons using screen readers, using one of Dreamweaver's tools to convert airline website text to accessible formats. Mr. Wakefield estimated that the costs of Dreamweaver products available on the market range from $400-$1200; or an average cost of $800 per unit.

Department staff also obtained estimates on the labor time and costs to implement accessible websites from Ms. Johnnie Burham, DOT's web master for 508 implementation. Ms. Burnham estimated that DOT spent approximately $15,000 to hire a private consultant with highly skilled programmers to make its website accessible to persons with disabilities. She commented that the amount of work and employee training needed will vary, depending on the present status, design and complexity of a website. She estimates that airline web masters who are up-to-date on the World Wide W ebConsortium's WCAG and take DOT's free on-site training course (also available on a CD-ROM from DOT) should be able to modify their reservation websites at minimal costs. She also estimates a highly skilled programmer makes roughly $50 per hour.

2.9 Proposed Foreign Carrier Personnel and Training Cost Requirements

The NPRM proposal would require affected foreign carriers operating aircraft (with 19 or more seats) to provide training to all existing and new hire personnel

[29]Matthew Pizzi and Zak Ruvalcaba, Micromedia Dreamweaver MX Unleashed, Indianapolis, Indiana 46290, 2003 copyright by Sams Publishing.

in contact with travelers with disabilities regarding (1) DOT's final ACAA regulations; (2) the carrier's policies and procedures for implementing these regulations; and (3) sensitivity training regarding awareness and appropriate responses to persons with different types of disabilities. Candidates for training identified in the NPRM include, but are not limited to, flight crews, gate agents, ramp and baggage handlers, reservation and ticket counter agents, customer service staff, and operators of aircraft boarding equipment. In addition, the NPRM would require carriers to appoint and train Complaints Resolution Officials (CROs) to be available at all U.S. airports they serve within 60 days of the final rule's effective date. The NPRM requires CROs to be trained on all topics listed above, as well as duties pertinent to their job in fielding complaints of passengers with disabilities. Carriers also must ensure that contractor personnel who deal with the traveling public also receive the same training as carrier employees, appropriate to their duties.

2.9.1 Data Collection on Foreign Carrier Employees Subject to the NPRM Proposals

An internet search for data on the number of foreign carrier employees who would have to undergo training required by the NPRM focused on the websites of international organizations representing these carriers. Initial searches of the websites for IATA, the Airclaims Group, Ltd, Air Transport World, OAG, and ICAO produced only a few sites that collected world airline employee statistics. None of the employee data could be downloaded without a substantial charge. However, DOT was able to locate a copy of ICAO's 2000 Statistical Digest that includes worldwide employee and fleet data reported by ICAO's 62 Contracting States for 194 scheduled airlines. (ICAO's 2001 Statistical Digest was delayed due to the 9/11/01 terrorist attacks.) [30]

2.9.2 Training Cost Assumptions

The NPRM does not specify any number of training program hours per

[30] *Digest of Statistics N. 497,* International Civil Aviation Organization, Montreal, Quebec, Canada, 2000.

employee, but carrier and contract employees would have to complete initial training to proficiency within one year of the final rule's effective date, and receive refresher training in subsequent years to maintain proficiency. The assumptions for foreign carriers' initial and recurrent employee training, including training for new hires, are based on the number of employee hours and job categories provided for U.S. carriers in DOT's 1990 regulatory cost evaluation of the final ACAA rule.

Based on the International Civil Aviation Organization's (ICAO) 2000 database of foreign carriers' worldwide flight operations, employee and wage scales, a sample of 43 foreign air carriers was constructed, based on their total employment counts for flight and ground crews supporting worldwide flights. These data were adjusted, based on the estimated percentage of the U.S. share of total worldwide flight departures reported in the BTS international database, to estimate the portion of potential employees used in U.S. flight operations that would be required by the NPRM to undergo training. This sample was doubled to an 86 carrier sample representing almost 70% of the targeted group of 125 foreign carriers potentially subject to the NPRM requirements. It includes many of the largest foreign carriers that transport approximately 90% of total international passengers carried on foreign airlines between U.S. and foreign airports. The adjusted employee counts, together with average wage scales for pilots, co-pilots, other cockpit crew, flight attendants, ticket and sales agents, and ground crews, are used to develop partial estimates of the potential compliance costs to foreign carriers of meeting DOT's proposed personnel training requirements. These estimates were increased by 15% to project the total employee counts for smaller foreign regional and commuter carriers subject to the NPRM proposed training requirements.

In developing these costs, the Department assumes that each carrier will use in-house personnel to consult with groups representing passengers with disabilities and develop their training programs, and educate in-house instructors teach the courses. Estimates of turnover rates for foreign carrier personnel and their contract employees are based on U.S. carriers' employee rates. The analysis assumes that carriers will provide training course material to contractors and require them to train their personnel. In practice, of course,

employee training costs will vary among carriers, depending on the content of their present training courses. Many major foreign carriers that are code-share partners of U.S. major airlines may already provide adequate training to employees on passenger with disabilities.

2.10 Compliance Cost Estimates of DOT's Proposed Rule's Accessible Equipment and Personnel Training Requirements

The proposed rule would generate costs to 125 foreign air carriers providing scheduled and unscheduled non-stop air passenger service between foreign and U.S. airports. If the Department published its final rule in 2005 and foreign carriers begin in 2007 to replace 1/20th of their inaccessible fleets per year, they would achieve 100 percent fleet accessibility by 2027, and incur recurrent capital costs to replace old aircraft in every year thereafter. Tables ES-1 and ES-2 in Appendix B present detailed summaries of the potential compliance costs to these carriers of implementing the NPRM proposals, estimated for both low and high cost cases. Tables A-1 through D-3 and G-1 present compliance cost estimates for each of the NPRM equipment and website proposals (based on varying assumptions about the types and amounts of accessible equipment that carriers would acquire, and the amount of lost revenue on Airbus twin-aisle aircraft due to foregoing 2-4 seats to install accessible lavatories). Estimates of personnel training costs are presented in Tables E-1, E-2, H-1 and H-2.

Under the low cost case, the potential 20-year compliance costs to foreign carriers to implement DOT's proposed rule would total $325.7 million. These costs are assumed to begin in the first year following the final rule's publication date when carriers would be required to (1) conduct negotiations with U.S. airport operators regarding responsibilities for purchasing aircraft boarding devices, (2) acquire and place on-board wheelchairs in the cabins of twin-aisle aircraft equipped with accessible lavatories, and (3) complete initial training of air and ground crew personnel. The present value of these total costs is estimated at $116.4 million over 20 years (discounted at 7% per year), with an average annual outlay of about $16.2 million (derived from dividing total costs by 20 years). The lower costs would result from carriers' assumed purchases of

the least expensive push/tow passenger boarding ramps, chairs, and standard power lifts; least expensive on-board wheelchairs; and low revenue losses from foregone seats to install accessible lavatories.

Under the high cost case, the 20-year potential compliance costs to foreign carriers of implementing the NPRM regulatory proposals would total approximately $415.6 million, beginning in the first year after the final rule's effective date. The present value of these costs is estimated at $204.7 million over 20 years (discounted at 7% per annum), with an average annual outlay of $20.8 million. The high cost case is based on foreign carriers' assumed purchases of a mix of standard to deluxe model aircraft boarding lifts (with enclosed, heated passenger and driver cabins for use in cold weather climates) and higher revenue losses estimated by FAA's elasticity model from foregone seats to install accessible lavatories.

CHAPTER 3

Benefits of Proposed Rule to Passengers and Other Members of the Public

The main reason for being of the ACAA is to ensure nondiscrimination on the basis of disability and accessibility of air travel to people with disabilities. Consequently, the most important benefits of this proposed amendment, like those of the underlying ACAA rule itself, are the largely non-quantifiable benefits of increased access and mobility for passengers with disabilities. These proposals would eliminate most air travel barriers and policies of foreign carriers that prevent or inhibit travel by persons with disabilities. The benefits that would accrue from removal of these barriers cannot be quantified, but could well include increased employment, business, recreational and educational opportunities for air travelers with disabilities, and quality of life enhancements associated with travel opportunities to points throughout the world.

Many persons with mobility impairments would be able to use foreign carrier air services for the first time, and take advantage of an expanded range of travel package deals and fare discounts. Moreover, the universality of accessible aircraft, terminals, telecommunications and information technology services provided by foreign carriers serving U.S. airports would enable passengers with disabilities to make safer and more seamless air travel journeys. Even persons with disabilities who did not immediately choose to travel by air on foreign air carriers would know that barriers to such travel had been removed, and there is a psychological benefit to knowing one can travel if one wishes (what economists sometimes refer to as the "option value" of a regulatory provision).

The regulatory proposals for accessible foreign and U.S. airline websites would be of benefit to blind persons and others with vision impairments who

now either cannot independently take advantage of this time- and cost-saving method of learning about travel opportunities and booking seats. The provision of accessible tags and enlarged print on websites would enable blind and visually-impaired persons to book their flights directly with airlines and take advantage of fare discounts, travel mile bonuses, and bargain package deals offered exclusively to on-line customers. Consequently, there would be some economic benefits directly accruing to passengers, though we do not know the amount of these benefits.

Aircraft boarding equipment requirements would eliminate some foreign carriers' practices of hand-carrying passengers with mobility problems onto aircraft. This equipment would benefit ground crew employees and passengers, reducing their risks of injuries and medical costs. It would also provide a more dignified and less frightening method of boarding aircraft, which may now deter some passengers from traveling. Foreign carriers would realize indirect benefits from providing aircraft boarding equipment, including reduced employee absences, workman's compensation claims, and litigation. Other beneficiaries of the proposed rule would include the travel companions, family and friends of air travelers with disabilities, since persons with disabilities would have greater independence in making travel arrangements and airline personnel would provide baggage and airport assistance.

In addition, some of the Department's regulatory proposals (e.g., accessible airline reservation websites; provision of wheelchairs and accessible passenger shuttles in foreign carriers' airport terminals; aircraft cabin wheelchairs and accessible lavatories) would benefit other members of the traveling public.

In the next chapter, the Department estimates the number of passengers and others who are likely to benefit from the proposed accessibility improvements. "New" passengers with disabilities who travel on foreign carriers because barriers have been removed are clearly beneficiaries of the rule. While this information does not permit us to quantify the value of the benefits to

these passengers, it does indicate the scope of the population that would benefit from the NPRM's proposals.

CHAPTER 4 - BENEFITS TO AIR CARRIERS

4.1 Overview

As stated in the previous chapter, the nonquantifiable benefits of the ACAA regulation to passengers with disabilities is the regulation's main reason for being. These benefits, standing alone, justify the compliance costs of the regulation to air carriers. However, it is frequently assumed that these benefits are the only benefits of a nondiscrimination rule, and that passengers are the only beneficiaries. Nondiscrimination rules, this assumption would suggest, have only costs for providers of transportation and other services, and no benefits.

In the case of these ACAA proposals, this assumption appears to be incorrect. Specifically, making foreign air carriers' services accessible to people with disabilities is likely to result in an increase in passenger traffic, creating an increase in revenues that would more than offset the compliance costs of the proposed rule. While there is uncertainty about the magnitude of this effect, which the Department addresses in the sensitivity analysis in Chapter 5, the Department believes that it is reasonable to conclude from available data that the economic benefits of the rule to foreign air carriers will exceed the compliance costs of the rule over the 20-year PRE study period.

4.2 Analytical Approach

This analysis is designed to assess the potential revenue gains to foreign carriers from new international travelers with disabilities and travel companions,

stimulated by their provision of accessible aircraft and related services. Both total and present-value revenue gains are projected over the 20-year PRE study period. Both low cost case and high cost case scenarios are considered with respect to accessibility-induced growth in the volume of international passengers with disabilities.

The principal sources of data used in developing the analysis are:

- The Canadian Air Transport Regulations (as amended under SOR/88PartVII and SOR/89-3069) requiring uniform conditions of carriage for disabled air passengers, provision of airport wheelchairs, passenger trolleys, complaints systems, etc. by 1989, and completion of initial training of air carrier employees to assist disabled air passengers by 1995;
- The Canadian Transportation Agency's (CTA) 1995 Code of Practice Aircraft Accessibility Regulations;
- 1995 and 2000 data on Canadian air passengers with disabilities from a July 1996 Transport Canada study report (1) and from CTA's 2000 airport survey;[2]
- 1995-2000 growth in the number of Canadian passengers with disabilities due to new regulations;
- 1995 and 2000 Transport Canada data on total domestic and international Canadian air passengers transported by commercial and charter carriers and 2001-2015 aviation forecasts;[4]

1- *Transportation and Disability in Canada: an Overview,* Goss Gillroy, Inc., for Transport Canada, Ottawa, Canada, July 1996

[2] *Summary Report of 2000 Airport Survey of Canadian Air Passengers With Disabilities,* Canadian Transportation Agency, Ottawa Canada, 2001.

[4]*Summary Report 2002, Aviation Forecasts 2001-2015,* Transport Canada website: : http://www/cat-otc.gc.ca/POL/EN/airforecasting/summary02.html

- 2001-2002 (according to ICAO there was zero growth between 2001 and 2002) data from DOT's Bureau of Transportation Statistics on total inbound and outbound international passengers transported by commercial (including charter) foreign air carriers on 60+ seat aircraft between foreign and U.S. airports;[5] and

- 2002 data from IATA on the average international passenger fare and passenger growth rates reported by member airlines.

This material is used to establish baseline estimates of foreign carriers operating in the U.S.; the number of existing disabled passengers transported by these carriers to the U.S.; the number of projected new passengers with disabilities traveling due to the implementation of DOT air access proposals; average international fares; and projected long-range passenger and revenue growth. Data on regional and commuter foreign carriers that operate aircraft with 60 or fewer seats to the U.S. could not be collected and analyzed within the PRE's time frame; thus, the projections of new passengers and revenue are understated. The Department encourages carriers and any other parties who have this information to submit these data in comments to the NPRM docket, so that the final regulatory evaluation can be more complete in this respect.

4.3 Methodology

This analysis is conducted in two phases. The first phase focuses on 1995-2000 Canadian air carrier implementation of aircraft accessibility and carrier personnel training regulations, and survey data on Canadian air passengers with disabilities from Transport Canada and the Canadian Transportation Agency. These data are used to establish 1995 and 2000 baseline estimates of the number

[5] *BTS T-100(f) Part 129 Foreign Airlines International Traffic and Capacity Database, Passenger Segment, 2001.*

of Canadian air passengers with disabilities who traveled before and during the implementation of the air carrier access regulations. Several adjustments are made to the baseline estimates. Based on data from the 1995 American Travel Survey, the 1995 Canadian baseline estimate is increased by 22% to include additional air passengers (family travel companions and personal attendants) reported by Canadian respondents with disabilities to have accompanied them on their air trips. The percentage of 1995 baseline Canadian passengers with disabilities who traveled to the U.S. is based on Transport Canada's estimate of the 1995 total inbound and outbound air passengers from Canada transported to the U.S. on Canadian air carriers (including major, regional and commuter airlines).[7] This percentage will be applied in the second phase of the analysis to establish a baseline estimate of the number of existing passengers with disabilities and companions transported by foreign carriers to and from the U.S.

Next, a demand model developed by DOT consultant Dr. David Lewis is used to project low and high estimates of the 1995-2002 growth in new Canadian air passengers with disabilities that was stimulated by Canadian air carriers' five-year implementation of the Canadian accessibility regulations. These growth rates are applied in the second phase of analysis to establish a baseline estimate of new international passengers with disabilities that would be realized by foreign carriers implementing DOT air access regulations on U.S. routes, and to project the incremental growth in new passengers over the 20-year PRE study period.

To perform the second phase of the analysis, the Bureau of Transportation Statistics prepared a summary table of 2001 international passenger traffic and capacity data reported by scheduled and unscheduled foreign carriers conducting flights on aircraft with 60 or more seats between foreign and U.S. airports.[9] The baseline estimate of total international passengers transported by

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[7]Ibid, *Summary Report 2002, Aviation Forecasts 2001-2015.*

[9] Source: T-100(f) International Foreign Carrier Database, Bureau of transportation Statistics, U.S. Department of Transportation, Washington, D..C.

foreign carriers to and from the U.S. is taken from this BTS data. The percentage of 1995 disabled Canadian passengers who traveled to the U.S. is applied to the baseline estimate of foreign carriers' total inbound and outbound air passengers to compute the baseline estimate of existing international passengers with disabilities transported on foreign carrier flights to the U.S.

Low and high growth rates for new Canadian disabled air passengers were computed by a consultant's model that measures the incidence of air travel by Canadians with disabilities in 1995 before implementation of air carrier personnel training programs, and in 2000 after completion of regulations requiring all new and replacement planes in the Canadian fleet to be equipped with aircraft accessibility equipment. These growth rates are applied to the baseline estimate of existing international air passengers with disabilities to estimate the potential new demand that foreign carriers might realize due to implementation of DOT's regulatory proposals over the next 20 years. The new passenger estimates are multiplied by the 2002 average international fare charged by IATA airline members to project the incremental revenues to foreign carriers over the 20-year study period. The present value of projected total revenue gains is then compared to foreign carriers' total present value compliance costs of implementing accessible U.S. air services to assess the net impacts of DOT's proposed rule.

4.4 Canadian Air Carrier Accessibility Regulations

Canada's Air Transport Regulations were first amended in 1988 to require Canadian air carriers to adopt Uniform Conditions of Carriage for Disabled Passengers by 1989. A second amendment was added in 1989 to require air carrier personnel to be trained to provide appropriate assistance to air passengers with disabilities beginning in January 1995.[10] The Canadian

[10]Canadian National Transportation Act, SOR/89-3069, Air Transport Regulations, Personnel Training Requirements for the Assistance of Persons with Disabilities, 1989.

Transportation Agency's 1995 Code of Practice requires Canadian carriers to install accessible equipment on new aircraft with 30 or more seats between 1997-2000.[11] These regulations are similar to those of the U.S., except they do not apply to 19-30 seat aircraft or require passenger boarding lifts or ramps for ground-loaded aircraft. However, Canadian carriers must retrofit existing narrow-bodied planes with accessible hardware devices and existing twin-aisle aircraft with accessible lavatories that can accommodate on-board wheelchairs by 2002. In these respects, the Canadian rules exceed the U.S. regulations.

4.5 Surveys of Canadian Air Passengers with Disabilities Before and After Implementation of Air Carrier Accessibility Regulations

4.5.1 Transport Canada 1995 Study of Canadian Air Passengers with Disabilities

Transport Canada contracted a 1993-1996 project to Goss Gilroy, Inc., that included tasks to develop 1995 estimates of the Canadian population with disabilities and their use of intercity travel modes.[12] Goss Gilroy used data reported by Canadian residents in the 1991 Canadian Health Activity and Limitation Survey, and applied average annual population and air passenger growth rates for disabled persons to estimate the 1995 population of 3.8 million Canadians with disabilities and 1.5 million total disabled travelers on all intercity transportation modes.[13] Of total travelers, Goss Gilroy identified 715,000 Canadian adult residents (age 15 or more) with disabilities who traveled. by air

[11]Code of Practice, Aircraft Accessibility for Persons with Disabilities, Canadian Transportation Agency, website: http://www/cat-otc.gc.ca/access/codes/air/index_e.html

[12] Transport Canada Development Center R&D Project #8023. Transport Canada website: http//www.tc.gc.ca/tdc/projects/access/e/8023.html

[13]*Transportation and Disability in Canada: An Overview,* Goss Gilroy, Inc. Report for Transport Canada,, Ottawa, Canada, July 1995.

in 1995, and projected an additional 11% (or approximately a total of 797,000 disabled air passengers) in 2000.[14] According to Goss Gilroy's study director, these estimates did not include additional air passengers (consisting of family travel companions and personal attendants) who often accompany disabled passengers on air trips, nor the potential growth in the number of passengers with disabilities resulting from implementation of the Canadian air carrier access regulations.[15]

4.5.2 2000 Survey of Canadian Air Travelers with Disabilities

The 1995 Goss Gilroy estimate of 715,000 Canadian adult air travelers did not provide a breakdown of the different types of disabilities reported by these travelers. Therefore, we are using disability data reported in CTA's 2000 air passenger survey at six Canadian international airports of passengers with disabilities and senior travelers. Of total CTA survey respondents, 65% were air passengers with disabilities. Within this 65%, 37% were wheelchair and scooter users; 48% used walkers, crutches, and canes; 11% were blind or had low vision; 3% were deaf, 31% had other hearing impairments; and 52% reported other chronic conditions (the sum exceeds 100% due to reporting of multiple disabilities).

4.5.3 Profile of the "Typical" Canadian Air Passenger with a Disability

Based on travel characteristics reported by CTA's 2000 survey respondents, the "typical" Canadian passenger with a disability was female, age

[14]Section 5, Summary of Major Findings: 2000 Air Accessibility Survey Report, Canadian Transportation Agency, Ottawa, Canada.

[15] .Interview with Alex Turnbull, Project Director of 1995 Transport Canada study, and former partner of Goss Gilroy Inc, Ottawa, Canada, May 2003.

65 or older, had a severe mobility impairment, took two or more annual air trips for vacations and family visits, had sufficient disposable income to finance all of the air trips she wanted to make, and expressed overall satisfaction with air carriers' implementation of the air access regulations.

4.6 Analysis of New Canadian Air Passenger Demand Stimulated by Air Carriers Implementation of 1995-2000 Air Transport Accessibility Regulations

The following adjustments are made to Transport Canada's 1995 estimate of 715,000 Canadian adult air passengers with disabilities to increase the passenger count to include family and other travel companions, and measure the incidence of growth in new passenger demand over the regulatory implementation periods. Canadian survey data indicates 39% of air traveler respondents reported receiving travel assistance from attendants; however, they were not asked to specify how many were air carrier personnel, family companions or personal attendants.[16] Based on estimates from the 1995 American Travel Survey, 17% of air travelers with disabilities were accompanied by family travel companions, and 5% by personal attendants.[17] Applying this 22% increase to the 1995 baseline estimate of 715,000 disabled passengers yields 157,300 additional air passengers, and results in an adjusted 1995 baseline estimate of 872,300 Canadian adult air passengers with disabilities, travel companions, and personal attendants (henceforth referred to as air travel companions).

4.6.1 Latent Demand for International Air Travel by Persons With Disabilities

Although people whose disabilities create hardships for them in the use of

[16]Op cit. *CTA Summary 2000 Survey Report Air Passengers With Disabilities*

[17]Op cit, USDOT ITS/ATS95-US Report, October 1997.

airline services represent about two percent of the general population, it is only a small fraction of these, about 10 percent to 20 percent -- for whom regulatory change eliminates absolute barriers. Lower incomes and greater age, two persistent attributes of the disabled demographic, mitigate their rate of air travel. These realities mean that the incidence of travelers with disabilities among total air travelers will be far less than proportional to the incidence of disability in the population at-large even after full implementation of the air access regulations. Disabled people will still be poorer and older, on average, than the general population; and the implementation of transportation accessibility regulations will lift absolute physical barriers for only a minority.

4.6.2 Growth Increase in New Canadian Air Passengers With Disabilities Due to Canadian Carriers Implementing Accessibility Regulations to Remove Air Travel Barriers

A model analysis developed by DOT consultant Dr. David Lewis is used to estimate the potential growth in new Canadian air passengers with disabilities due to air carriers' implementation of the government's air carrier access regulations. The model measures the incidence of Canadians with disabilities in total air enplanements in 1995, and the potential increase in their enplanements in 2001, due to the 6-year implementation of the air carrier accessibility regulations. The model is based on assumptions regarding the percentage of the Canadian population with disabilities, their relative incomes, relative age, income elasticity, and measures the impacts of physical air travel barriers on disabled air passengers propensity to travel. Based on these assumptions, the model analysis suggests that over the six-year (1995 to 2001) implementation of the air access regulations, air travel in Canada by people with disabilities would have increased by between nine percent and 17 percent, due to Canadian air carriers removal of air travel barriers, as presented in Table 4-1.

Applying the model's 6-year growth increases of 9% to 17% on an

incremental basis to the 1995 baseline estimate of 872,300 Canadian adult disabled passengers and travel companions, as adjusted by assuming a population increase of 1% per year[19], yields low and high case increases of 83,337 to 157,414 new Canadian air passengers with disabilities and companions in 2001, as shown in Table 4-2.

TABLE 4-1 Canadian Air Passengers with Disabilities Projected Growth Rates

Model Assumptions	
People with disabilities as a percentage of total population	2.00%
Average income of people with disabilities as a percentage of income of the general population	50.00%
Average age of people with disabilities as a percentage of age in the general population	130.00%
Income elasticity of air travel	1.2
Propensity to travel with age (over and above income effects)	-0.3
Impact of barriers on traveling propensity	-10.00%
Model Calculation	2.00%

[19] This one percent increase is very conservative. For example, the Canadian Census Bureau projects a 30% increase in the senior citizen age group (60-79) between 2001 and 2011 as the initial wave of baby boomers enters this age group and incur a greater propensity to acquire disabilities.

Baseline potential population of travelers with disabilities (as % of total passengers)		
Adjustment for lower income		-60.00%
Adjustment for higher age		-9.00%
Achievable population of travelers with disabilities in the absence of barriers (as % of total passengers)		0.6200%
Adjustment for barriers		20.00%
Population of travelers with disabilities when barriers are present (as % of total passengers)		0.7440%
Rate of growth in traffic of passengers with disabilities due to the removal of barriers		-16.67%

TABLE 4-2

Increase in New Canadian PWDs/Companions Due to Implementation of Air Carrier access Regulations

(PWDs = Passengers With Disabilities)

Year			New Passengers With Disabilities		
	Existing Can. Air PWDs	Low Multi-plier	Low Est.	High Multiplier	High Est.
1995	872,300	0.03	26,169	0.05	43,615
1996	881,023	0.04	35,241	0.07	61,672
1997	889,833	0.05	44,492	0.09	80,085
1998	898,732	0.06	53,924	0.11	99,849
1999	907,719	0.07	63,540	0.13	118,003
2000	916,796	0.08	73,343	0.15	137519
2001	925,964	0.09	83,337	0.17	157,414

Based on Transport Canada's estimates, a total of 60.1 million domestic and international air passengers were enplaned and deplaned in Canada in 1995 on Canadian commercial airlines. Of these, approximately 14.8 million air passengers, or 24.6%, traveled to the U.S.[20] According to the profile of the "typical" Canadian traveler with a disability (see CTA survey results, Section 4.5.3 above), the majority of survey respondents reported they took 2-5 annual air trips and had sufficient income to finance all trips they desired (similar to characteristics reported by non-disabled travelers). Based on the 1991 Canadian Health and Limitations Survey, 52% of Canadians with disabilities were

[20] *Table 2-1, Summary Aviation Forecasts in Canada - 2000,* Aviation Forecast Services, Transport Canada website: http://www.tc.gc.ca/POL/EN/airforecasting/summary02.htm

employed, compared to 65% of non-disabled Canadians. These findings suggest that air travelers with disabilities may travel more frequently and have a higher participation rate in the labor market than disabled travelers using other intercity modes. This analysis, therefore, assumes the 1995 baseline estimate of 872,300 Canadian disabled air passengers and travel companions traveled at three-quarters the rate of able-bodied Canadian air travelers in 1995, or 17.4%. Applying this percentage to the 1995 baseline estimate yields 150,908 disabled passengers and companions who traveled to the U.S. in that year, representing 1.0% of the 14.8 million total Canadian U.S. air travelers. This percentage will be applied in the second phase of the analysis to compute the base year number of existing international disabled air travelers transported on foreign flag carriers' flights between foreign and U.S airports.

4.7 Potential New International Passenger Demand for Accessible Foreign Carrier US Air Service and Potential Revenue Gains Due to Implementing DOT Proposals

To perform the benefit analysis of the potential revenue gains to foreign carriers from implementing DOT's NPRM proposals, BTS prepared a summary table of 2001 international passenger traffic and capacity data reported by foreign carriers operating 60+seat aircraft between foreign and U.S. airports (excluding Canadian and All Nippon airline passengers).21 The baseline estimate of 65,069,782 total international air passengers transported by foreign carriers to and from the U.S. presented in Table 4-3 (column 2) is from this BTS database. This baseline estimate is multiplied by the 1.0 percent of Canadian disabled travelers to the U.S. in 1995 prior to Canadian carriers implementation of the air access regulations to compute the baseline estimate of 657,205 existing international passengers with disabilities transported to the U.S. on foreign flag

21 Source: T-100(f) International Foreign Carrier Database, Bureau of transportation Statistics, U.S. Department of Transportation, Washington, D..C.

carriers' aircraft flights (see column 3, year 1).

The number of existing foreign carrier disabled passengers (715,768) is then multiplied by the projected growth rate in new Canadian disabled air passengers computed by the model in Table 4-2. This results in a projection of 722,925 for Year 1, an increase of 7,158 for both the high and low case scenarios. For years 2-20, the projection of increased travel by disabled passengers differs between the high and low cases, with the high case number being double the low case number or more (e.g., 91,352 vs. 45,676 in Year 6).

Based on IATA's 2002 estimate of an average $448 international air fare charged by its member airlines multiplied by the low case and high case incremental growth in new passengers with disabilities and travel companions, the potential revenue gains of approximately $3.2 in Year 1 for both the high and low cases. In Year 6, the projected revenue gains would be $20.5 million and $40.9 million for the high and low cases, respectively.

These baseline passenger trip and revenue estimates are used to project the potential total revenues that would be generated by new passengers with disabilities over the PRE's 20-year study period due to foreign carriers' implementation of DOT's air access proposals. Based on the estimates in Table 4-3, the 20-year projected present value revenue to foreign carriers from new international passengers with disabilities would range from $325.7 million (under the low cost case) to $615.3 million (under the high cost case). Based on the compliance cost estimates in Chapter 3, the projected present-value costs to foreign carriers to comply with DOT's proposed air access regulations**,** range from $166.4 million (under the low cost case) to $204.7 million (under the high cost case) over the 20-year study period. The projected low case revenue gains to foreign carriers in Table 4.3 would cover the high cost case compliance cost estimates.

TABLE 4-3

Asumptions

Discount rate	7.0%	
Years Included	19	
Int'l PAX Growth/yr		5.0%
Disb. PAX Growth/yr		5.0%
Disb. PAX share of Int'l PAX	1.1%	
Low Case Reg Impact		9.0%
High Case Reg Impact	17.0%	
Average Int'l Fare	$448	
Int'l Fare Growth/yr		0%

Yr	Baseline Total Foreign Carrier International Passengers To/From U.S.1	Baseline Foreign Carriers' Pass. w/Disabilities (PWD) To/From U.S.2	New PWDs On Foreign Carriers' Flights to/from U.S After Regulations Implemented - Low Case	% Disabled of Total PAX - Post Regulation - Low Case	Growth Due to Regulations - Low Case	Impact on PWDs - Low Case	New PWDs On Foreign Carriers' Flights to/from U.S After Regulations Implemented - High Case	% Disab. of Total PAX - Post Regulation High Case	Growth Due to Regulations - High Case	Impact on PWDs - High Case	Incremental Revenue due to New Regulations - Low Case	PV Cas
1	65,069,782	715,768	722,925	1.11%	7,158	1.0%	722,925	1.11%	7,158	1.0%	3,206,639	2,99
2	68,323,271	751,556	759,072	1.11%	7,516	1.0%	766,587	1.12%	15,031	2.0%	3,366,971	2,94
3	71,739,435	789,134	804,916	1.12%	15,783	2.0%	820,699	1.14%	31,565	4.0%	7,070,639	5,77
4	75,326,406	828,590	853,448	1.13%	24,858	3.0%	878,306	1.17%	49,715	6.0%	11,136,256	8,49
5	79,092,727	870,020	904,821	1.14%	34,801	4.0%	939,622	1.19%	69,602	8.0%	15,590,758	11,1 5
6	83,047,363	913,521	959,197	1.16%	45,676	5.0%	1,004,873	1.21%	91,352	10.0%	20,462,870	13,6 4
7	87,199,731	959,197	1,016,749	1.17%	57,552	6.0%	1,074,301	1.23%	115,104	12.0%	25,783,217	16,0 1
8	91,559,718	1,007,157	1,077,658	1.18%	70,501	7.0%	1,138,087	1.24%	130,930	13.0%	31,584,440	18,3 2
9	96,137,704	1,057,515	1,142,116	1.19%	84,601	8.0%	1,205,567	1.25%	148,052	14.0%	37,901,328	20,6 1
10	100,944,589	1,110,390	1,199,222	1.19%	88,831	8.0%	1,276,949	1.27%	166,559	15.0%	39,796,395	20,2 9
11	105,991,818	1,165,910	1,270,842	1.20%	104,932	9.0%	1,364,115	1.29%	198,205	17.0%	47,009,491	22,3 1
12	111,291,409	1,224,206	1,334,384	1.20%	110,178	9.0%	1,432,320	1.29%	208,115	17.0%	49,359,966	21,9 5

13	116,855,980	1,285,416	1,401,103	1.20%	115,687	9.0%	1,503,936	1.29%	218,521	17.0%	51,827,964	21,53
14	122,698,779	1,349,687	1,471,158	1.20%	121,472	9.0%	1,579,133	1.29%	229,447	17.0%	54,419,362	21,17
15	128,833,718	1,417,171	1,544,716	1.20%	127,545	9.0%	1,658,090	1.29%	240,919	17.0%	57,140,330	20,75
16	135,275,403	1,488,029	1,621,952	1.20%	133,923	9.0%	1,740,994	1.29%	252,965	17.0%	59,997,347	20,37
17	142,039,174	1,562,431	1,703,050	1.20%	140,619	9.0%	1,828,044	1.29%	265,613	17.0%	62,997,214	19,95
18	149,141,132	1,640,552	1,788,202	1.20%	147,650	9.0%	1,919,446	1.29%	278,894	17.0%	66,147,075	19,53
19	156,598,189	1,722,580	1,877,612	1.20%	155,032	9.0%	2,015,419	1.29%	292,839	17.0%	69,454,429	19,28
20	164,428,098	1,808,709	1,971,493	1.20%	162,784	9.0%	2,116,190	1.29%	307,481	17.0%	72,927,150	18,81

Present Value of Incremental Revenues in Low Case: **$325,701,323**
Present Value of Incremental Revenues in Low Case: **$615,268,120**

NOTES:

1.Base year from BTS T-100(f) International Passenger Database. Future year passenger growth of 5%/yr based on IATA forecasts. Source: IATA CEO State of the Industry Speech, Press Release 06/02/02.

2. 2002 estimate of existing FC passengers with disabilities represent 1.1% of total passengers reported by FC to U.S. based on estimate of Canadian disabled air passengers who traveled to U.S. in 1995, as percentage of total U.S. bound Canadian air passengers in 1995, before implementation of air carrier access regs.

3.Based on low/high 9%-17% growth in new air passengers w/ disabilities due to implemenation of DOT regs (assumes incremental growth rates yrs 1-10, 9%-17% steady state thereafter. Source: Dr. David Lewis model analysis of growth in Canadian disabled air passengers due to Canada's air carrier access regulations, HLB Decision Economics Inc. Ottawa, Canada.

4. Average 2002 international passenger fare reported by IATA member airlines. Source: Speech IATA CEO Bisignoni, IATA Press Release, July 2002

Chapter 5 – Sensitivity Analysis of Incremental Foreign Revenue Growth Due to Proposed ACAA Rule

Summary

The risk and sensitivity analysis indicates a 90 percent probability that incremental foreign airline revenue would exceed $317 million over the 20 year forecast period (in constant 2003 dollars); the chance of incremental revenues exceeding $680 million over the period is less than five percent.

Baseline Projections

The data displayed in Table 4-3 assume a baseline growth rate (growth in the absence of the regulation) in passenger enplanements among passengers with disabilities. Consistent with empirical evidence, this assumption posits that enplanements of passengers with disabilities will grow in proportion to the growth of passenger enplanements generally.

The baseline values in Table 4-3 for the present value of 20-year incremental foreign airline revenue growth due to the regulation are as follows:

- $325.7 million over 20 years in the Low Case; and
- $615.3 million over 20 years the High Case.

Risk Analysis

Risk analysis entails the formulation of probability ranges for each of the principal variables that enter into the revenue forecast. Future revenues are then estimated with the statistical method called "simulation." Simulation is a process in which the variables are simultaneously varied thousands of times according to their probability ranges, yielding the probability range of future airline revenues.

Probability Ranges for Key Variables

Three markers describe the probability range for each variable: a central case, a lower case, and an upper case. The central case is the statistical median, the value for which there is a 50 percent probability being either too low or too high.

The lower case is the value with a ten percent chance of occurring below the median. The upper case is the value with a ten percent chance of occurring above the median. These three markers are based on historical data for each variable. Table 5-1 gives the probability analysis for each key variable in the revenue forecast. Figure 5-1 depicts how the simulation computer program converts the three markers to a probability distribution.

Risk Analysis Results

The simulation findings are reported in Table 5-2 (and shown graphically in Figure 5-2). The results indicate a 90 percent chance that foreign airline revenues would increase by $317 million (or more); a 50 percent chance that foreign airline revenues would increase by $443 million (or more); and a five percent chance that foreign airline revenues would increase by $679 million (or more).

Table 5-2 gives enplanements by passengers with disabilities as a share of total foreign airline enplanements under the risk analysis reported here. As shown, there is an estimated probability of 90 percent that the share will increase from 1.1 percent to 1.2 percent as a result of the regulation; and five percent probability that the share will increase to at least 1.3 percent.

Table 5-1: Probability Ranges for Key Variables

Variable	Median	10% Lower	10% Upper
Annual Growth in Total International Passenger Enplanements	5.0%	3.0%	7.0%
Annual Growth in International Enplanements by Passengers with Disabilities	5.0%	3.0%	7.0%
Impact of Regulation on Disabled Enplanements (% increase over Baseline at Steady-State)	10.0%	8.0%	17.0%
Ramp-up to Steady State: Impact of Regulation on Disabled Enplanements– Year 1	1.0%	0.8%	1.7%
Year 2	2.0%	1.6%	3.4%
Year 3	3.0%	2.4%	5.1%
Year 4	4.0%	3.2%	6.8%
Year 5	5.0%	4.0%	8.5%
Year 6	6.0%	4.8%	10.2%
Year 7	7.0%	5.6%	11.9%
Year 8	8.0%	6.4%	13.6%
Year 9	9.0%	7.2%	15.3%
Year 10	9.0%	7.2%	15.3%
Year 11	10%	8%	17%
Average International Airfare	$448	$381	$515

Risk Analysis Results for Total Airline Revenue Growth Due to Regulation

Probability of Exceeding Revenue	Present Value of Total Incremental Gross Airline Revenue Over 20 Years
95%	$295,139,104
90%	**$317,014,592**
85%	$335,879,968
80%	$356,377,952
75%	$369,761,856
70%	$383,183,872
65%	$397,490,432
60%	$412,162,560
55%	$427,840,608
50%	**$442,688,768**
45%	$458,013,664
40%	$475,069,888
35%	$495,766,432
30%	$508,924,000
25%	$533,034,208
20%	$554,893,696
15%	$581,279,360
10%	**$625,887,872**
5%	$679,481,152

Table 5-3:Enplanements by Passengers with Disabilities as a Share of Total Foreign Airline Enplanements

* Pre-Regulation assumption = 1.10%

Probability of Exceeding	Value
95%	1.18%
90%	**1.19%**
85%	1.19%
80%	1.20%
75%	1.21%
70%	1.21%
65%	1.21%
60%	1.22%
55%	1.22%
50%	**1.23%**
45%	1.23%
40%	1.24%
35%	1.25%
30%	1.25%
25%	1.26%
20%	1.27%
15%	1.28%
10%	**1.29%**
5%	1.30%

Figure 5-1: Probability Distributions for Disabled Passenger Growth

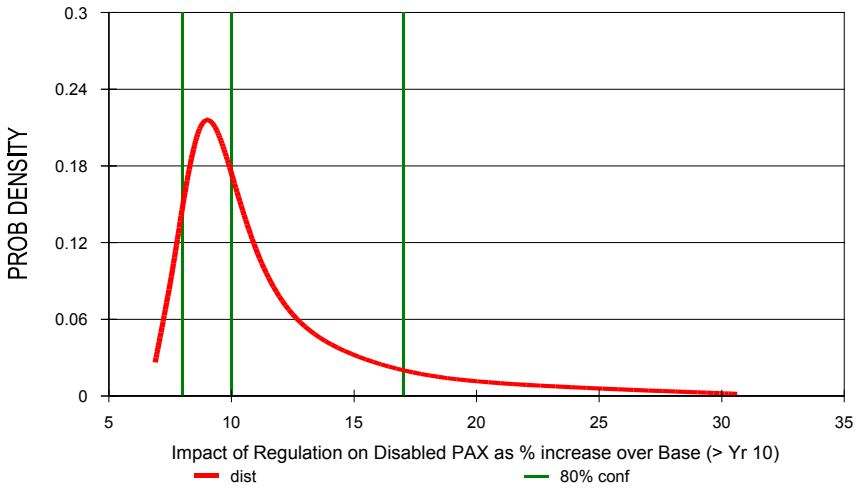
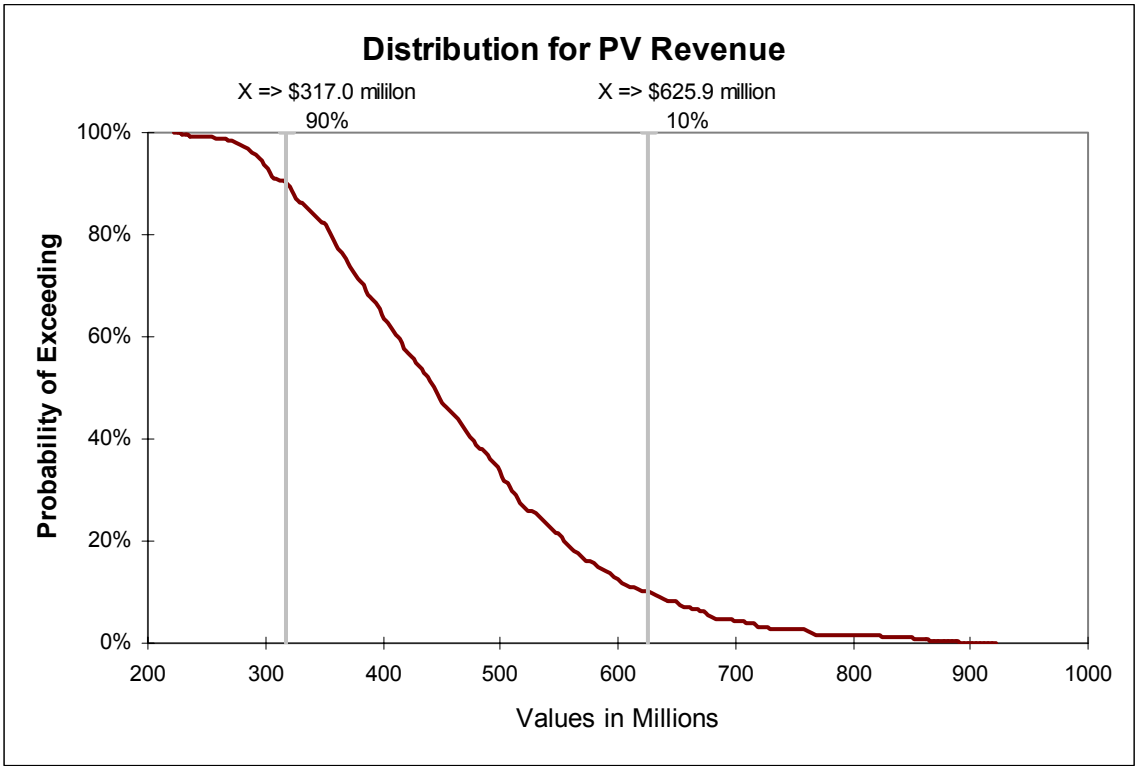


Figure 5-2: Probability Distribution of Additional Foreign Airline Revenue Due to Regulation



APPENDIX A

Attachment A-1

LIST OF MANUFACTURERS OF ACCESSIBLE AIRCRAFT EQUIPMENT

Adaptive Engineering LTD.
419 – 34th Avenue S.E.
Calgary, Alberta
Canada
T2G 1V1
Phone: (403) 243-9400
www.adaptivelifts.com
Adaptive Engineering LTD. Products: Express Ramp [Aircraft Boarding Equipment], Mobilift AX [Aircraft Boarding Equipment], and Mobilift AXR [Aircraft Boarding Equipment].

B/E Aerospace
Commercial Aircraft Products Division
1455 Fairchild Drive
Winston Salem, NC
Phone: (336) 767-2000
www.beaerospace.com
B/E Aerospace Products: Spectrum[Aircraft Seats], Reliance XL [Aircraft Seats], and Innovator 2 [Aircraft Seats].

Columbia Medical Manufacturing, LLC
13368 Beach Avenue
Marina Del Rey, CA 90292
Phone: (800) 454-6612 ext. 100
www.columbiamedical.com

Columbia Medical LLC Products: TravelMate 8020 [On-Board Wheelchair], TransportMate 9000 [On-Board Wheelchair], 8010 Boarding Wheelchair [Boarding Wheelchair], and 8000 Boarding Wheelchair [Boarding Wheelchair].

Graham-Field Health Products, Inc.
(Everest & Jennings Wheelchairs)
2395 Northeast Parkway
Atlanta, GA 30360
Phone: (800) 347-5678
www.everestjennings.com

Graham-Field Health Products: Metro [Terminal Wheelchair]

Ground Support Specialist LLC
2205 Cole Road
Horn Lake, MS 38637
Phone: (662) 342-1412
www.gssonline.com
Ground Support Specialist LLC Products: GS 240 [Aircraft Boarding Equipment]

nvacare Corporation
One Invacare Way
Elyria, Ohio 44036
Phone: (800) 333-6900
www.invacare.com
Invacare Products: IVC Tracer SX5 [Terminal Wheelchair]

Kurt Manufacturing Company
395 Ervin Industrial Drive
Jordan, MN 55352
Phone: (763) 502-6190
www.kurt.com
Kurt Manufacturing Products: Aviation Aisle Ease Wheelchair [Boarding Wheelchair], Aviation Aisle Lift Chair [Boarding Wheelchair], and Aviator Courtesy Wheelchair [Terminal Wheelchair].

Lift-A-Loft
9501 South Center Road
Muncie, IN 47302-9443
Phone: (765) 288-3691
www.liftaloft.com
Lift-A-Loft Products: SPEDL [Aircraft Boarding Equipment], WBEDPL [Aircraft Boarding Equipment], and APX16-DPL [Aircraft Boarding Equipment].

RJ Mobility LTD
Boy Lane
Wheatley, Halifax
HX3 5AF
United Kingdom
Phone: +44(01422) 358888
www.rjmobility.com
RJ Mobility Products: Airline Locker [On-Board Wheelchair] & Airport Aisle [Boarding chair].

TLD America
1034 A Harkins Road
Salinas, CA 93901
Phone: (831) 754-6206
www.tld-gse.com
TLD Products: DT5003 [Aircraft Boarding Equipment]

Turbo Way
PO Box 2828
White City, OR 97503
Phone: (541) 826-1801
www.turbo-way.com
Turbo Way Products: Turbo Way 2000 Passenger Ramp[Aircraft Boarding Equipment]

Attachment A-2

COMPARISON OF PASSENGER BOARDING PROCEDURES AND TIME REQUIREMENTS FOR FOUR EQUIPMENT OPTIONS

Based on the requirements outlined in the Notice of Proposed Rulemaking (NPRM), this section of the report details the procedures and time requirements for boarding wheelchair users with jetways or loading bridges, ramps, hand-crank lifts for accessing commuter aircraft, and vehicle-based hydraulic lifts designed to access commercial jets. The estimates presented in this section are based on the additional time required to board a wheelchair user as compared to the boarding requirements for a passenger who is not disabled. Estimates are based on input from air carriers and manufacturers of boarding equipment.

Jetways or Loading Bridges

The jetway (a trade name of the manufacturer of the product), or loading bridge, which offers seamless transportation from the gate to the airplane, is the most direct and least time-consuming method for boarding disabled passengers. Enplaning the disabled passenger requires an estimated four minutes of a steward or attendant's time. The steps involved in the loading process include transporting the passenger from the gate to the airplane, retrieving an on-board or aisle wheelchair, transferring the passenger onto the aisle wheelchair, transporting the passenger to their seat, and returning the on-board or aisle wheelchair to its original position. An additional two minutes is estimated for ground crew support to retrieve and stow the passenger's wheelchair on the aircraft. The total estimated time required to board the disabled passenger is four minutes. Labor requirements are estimated at six minutes, with four minutes allocated to the attendant and two minutes estimated for ground crew support.

Express Ramps

An express ramp can be used by both disabled and non-disabled passengers to board commuter aircraft. The slope of the ramp enables wheelchair users, who cannot walk up the steep stairs of the aircraft, to safely board small aircraft. Enplaning the disabled passenger requires an estimated 5.5 minutes of a steward or attendant's time. To safely enplane the passenger, the attendant must transfer the disabled passenger to the aircraft and up the ramp, retrieve an aisle or on-board wheelchair, assist in transferring the passenger onto the aisle wheelchair, transport the passenger to his or her seat, and return the on-board or aisle chair to its original position. An additional four minutes of ground crew time is estimated for pushing or towing the ramp into place, securing the ramp, stowing the passenger's wheelchair on the aircraft, and returning the ramp to its original position. Thus, the total estimated time required to board the disabled passenger is 5.5 minutes, and the required labor time is estimated at 9.5 minutes.

Hand-Cranked Lift

The hand-cranked lift enables air carriers to quickly and safely load disabled passengers from the ground to commuter aircraft. Enplaning the disables passenger requires an estimated 7 minutes of a steward or attendant's time. To enplane the passenger, the attendant must transfer the passenger from the gate onto the lift, secure the passenger on the lift, retrieve an on-board or aisle wheelchair, transfer the passenger onto the aisle wheelchair, transport the passenger to his or her seat, and return the aisle chair to its original position. An additional 5.5 minutes of ground crew time is estimated for pushing or towing the lift to the aircraft, positioning the lift in place next to the aircraft, using the hand-crank to lift the disabled passenger up to the aircraft, stowing the passenger's wheelchair on the aircraft, and returning the lift to its original position. Total boarding time is estimated at seven minutes. Total labor requirements is estimated at 12.5 minutes.

Vehicle-Based Hydraulic Lift

An elevating platform or passenger cabin mounted on the back of a truck allows an air carrier to lift disabled passengers to as high as 20', granting access to virtually all commercial jets. The vehicle-based hydraulic lift is designed to serve the large commercial jets boarded at national and international airports. Enplaning the disabled passenger requires an estimated 11.5 minutes of a steward or attendant's time. To safely enplane the passenger, the attendant must retrieve the aisle wheelchair, assist the passenger onto the vehicle loading gate, wait as the passenger is lifted up to the passenger cabin, wheel the disabled passenger into the cabin, secure the passenger, travel with the passenger in the cabin to the aircraft, release the security straps, transfer the passenger onto the aisle wheelchair, board the passenger, and return the aisle wheelchair to its original position. An additional 12.5 minutes of ground crew time is estimated for driving the unit to the gate, lowering the unit stabilizers, lifting the passenger gate up to the cabin, stowing the gate, raising the unit stabilizers, driving the unit to the aircraft, positioning the unit next to the aircraft, deploying stabilizers, elevating the passenger cabin, extending the unit deck to the aircraft, retracting the deck, lowering the passenger cabin, stowing the person's wheelchair on the aircraft, raising the stabilizers, and returning the attendant and equipment to their original positions. Total boarding time is estimated at 12.5 minutes. Total labor requirements is estimated at 24 minutes (12.5 minutes for the ground crew and 11.5 minutes for the attendant).

APPENDIX B – DATA TABLES